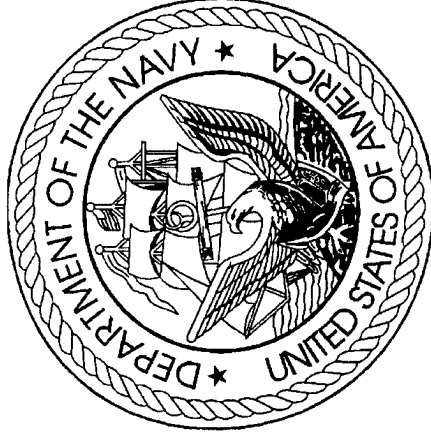


DEPARTMENT OF THE NAVY  
FISCAL YEAR (FY) 2001  
BUDGET ESTIMATES



JUSTIFICATION OF ESTIMATES  
FEBRUARY 2000

RESEARCH, DEVELOPMENT, TEST &  
EVALUATION, NAVY  
BUDGET ACTIVITY 7

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## UNCLASSIFIED

Department of the Navy  
FY 2001 RDT&E Program

Exhibit R-1

APPROPRIATION: 1319n Research, Development, Test and Evaluation, Navy DATE: February 2000

			Thousands of Dollars					
Line Number	R-1 Program Element Number	Item Nomenclature	Budget Activity	FY 1999	FY 2000	FY 2001	Security Classification	
153	0604227N	Harpoon Modifications	7	989	0	0	U	
154	0604805N	Commerical Operating & Support Savings	7	15,206	0	12,485	U	
155	0101221N	Strategic Sub & Weapons System Support	7	51,714	59,576	42,687	U	
156	0101224N	SSBN Security/Survivability Program	7	29,574	33,055	31,173	U	
		(R2/R3 Materials provided in Classified Budget Book)						
157	0101226N	Sub Acoustic Warfare Dev	7	7,871	3,178	879	U	
158	0204136N	F/A-18 Squadrons	7	294,735	320,884	248,093	U	
159	0204152N	E-2 Squadrons	7	45,176	36,330	18,698	U	
160	0204163N	Fleet Communications	7	14,858	11,371	12,012	U	
161	0204229N	Tomahawk & TMPC	7	149,793	141,417	91,436	U	
162	0204311N	Integrated Surveillance System	7	18,507	17,925	16,928	U	
163	0204413N	Amphib Tactical Support Units	7	1,822	0	7,911	U	
164	0204571N	Consolidated Training Systems Development	7	42,728	33,565	27,059	U	
165	0204575N	Information Warfare	7	4,440	9,112	9,924	U	
166	0205601N	HARM Improvement	7	28,411	38,427	21,355	U	
167	0205604N	Tactical Data Links	7	48,927	46,410	26,245	U	
168	0205620N	Surface ASW Combat Sys Integration	7	15,692	23,504	29,585	U	
169	0205632N	MK 48 ADCAP	7	16,597	20,314	15,853	U	
170	0205633N	Aviation Improvements	7	58,274	53,000	51,018	U	
171	0205667N	F-14 Upgrade	7	12,249	1,383	1,228	U	
172	0205675N	Operational Nuclear Power Systems	7	54,344	53,268	53,435	U	
		(R2/R3 Materials provided in Classified Budget Book)						
173	0206313M	Marine Corps Communications	7	49,208	96,293	96,153	U	
174	0206623M	MC Ground Combat/Spt Arms Sys	7	16,235	28,679	22,124	U	
175	0206624M	MC Combat Services Support	7	5,536	8,337	2,854	U	
176	0207161N	Tactical Air Intercept	7	57,066	39,830	21,705	U	
177	0207163N	AMRAAM	7	4,521	13,469	12,140	U	
183	0303906N	Aquarius	7	0	1,096	541	U	
		(Classified -- Material Not Available)						
181	0303901N	SIRIUS	7	30,624	47,486	28,577	U	
		(Classified -- Material Not Available)						

## UNCLASSIFIED

Department of the Navy  
FY 2001 RDT&E Program

Exhibit R-1

DATE: February 2000

APPROPRIATION: 1319n Research, Development, Test and Evaluation, Navy

		Thousands of Dollars					Security Classification
Line Number	Program Element Number	Item Nomenclature	Budget Activity	FY 1999	FY 2000	FY 2001	
178	0303109N	Satellite Communications (Space)	7	17,484	40,202	37,778	U
179	0303140N	Information Systems Security Plan	7	20,214	22,854	21,530	U
180	0303150N	Global Command and Control	7	422	0	0	U
182	0303905N	Pisces	7	481,272	485,424	502,822	U
		(Classified -- Material Not Available)					
186	0305160N	Def Meteorological Satellite Prog	7	11,755	14,497	19,730	U
187	0305188N	Joint (C4ISR) Battle Center	7	5,143	8,081	7,795	U
184	0303908N	Link Tanergine	7	231,946	0	207,000	U
185	0303909N	Retract Redwood	7	65,701	0	30,161	U
188	0305192N	Joint Military Intelligence Program	7	2,223	2,053	7,000	U
189	0305204M	Tactical UAV	7	5,959	0	0	U
		(R2/R3 Not Required/Prior Year Only)					
190	0305204N	Tactical UAV	7	50,843	75,325	113,052	U
191	0305206N	Airborne Reconnaissance Advanced Development	7	16,337	18,853	4,759	U
192	0305207N	DARP, Special Project Aircraft	7	30,002	39,738	27,479	U
193	0305208N	Distributed Common Ground Systems	7	4,933	5,552	4,482	U
194	0305927N	Navy Space Surv	7	378	1,708	2,038	U
195	0305972N	Integrated Broadcast Service	7	14,480	0	0	U
196	0308601N	Naval Modeling & Simulation	7	0	12,054	9,106	U
197	0702207N	Depot Maintenance	7	56,162	39,764	34,166	U
198	0708011N	Industrial Preparedness (MANTECH)	7	69,933	71,209	59,626	U
199	0708730N	Maritime Technology (MARITECH)	7	18,392	21,551	9,366	U
		Total Operational Systems Development		2,178,676	1,996,774	1,999,988	

## UNCLASSIFIED

Department of the Navy  
FY 2001 RDT&E Program  
Alphabetic Listing

Exhibit R-1

APPROPRIATION: 1319n Research, Development, Test and Evaluation, Navy DATE: February 2000

		Thousands of Dollars					Security Classification
Line Number	Program Element Number	Item Nomenclature	Budget Activity	FY 1999	FY 2000	FY 2001	
191	0305206N	Airborne Reconnaissance Advanced Development	7	16,337	18,853	4,759	U
163	0204413N	Amphib Tactical Support Units	7	1,822	0	7,911	U
177	0207163N	AMRAAM	7	4,521	13,469	12,140	U
183	0303906N	Aquarius	7	0	1,096	541	U
170	0205633N	Aviation Improvements	7	58,274	53,000	51,018	U
154	0604805N	Commerical Operating & Support Savings	7	15,206	0	12,485	U
164	0204571N	Consolidated Training Systems Development	7	42,728	33,565	27,059	U
192	0305207N	DARP, Special Project Aircraft	7	30,002	39,738	27,479	U
186	0305160N	Def Meterological Satellite Prog	7	11,755	14,497	19,730	U
197	0702207N	Depot Maintenance	7	56,162	39,764	34,166	U
193	0305208N	Distributed Common Ground Systems	7	4,933	5,552	4,482	U
159	0204152N	E-2 Squadrons	7	45,176	36,330	18,698	U
158	0204136N	F/A-18 Squadrons	7	294,735	320,884	248,093	U
171	0205667N	F-14 Upgrade	7	12,249	1,383	1,228	U
160	0204163N	Fleet Communications	7	14,858	11,371	12,012	U
180	0303150N	Global Command and Control	7	422	0	0	U
166	0205601N	HARM Improvement	7	28,411	38,427	21,355	U
153	0604227N	Harpoon Modifications	7	989	0	0	U
198	0708011N	Industrial Preparedness (MANTECH)	7	69,933	71,209	59,626	U
179	0303140N	Information Systems Security Plan	7	20,214	22,854	21,530	U
165	0204575N	Information Warfare	7	4,440	9,112	9,924	U
195	0305972N	Integrated Broadcast Service	7	14,480	0	0	U
162	0204311N	Integrated Surveillance System	7	18,507	17,925	16,928	U
187	0305188N	Joint (C4ISR) Battle Center	7	5,143	8,081	7,795	U
188	0305192N	Joint Military Intelligence Program	7	2,223	2,053	7,000	U
184	0303908N	Link Tanerigne	7	231,946	0	207,000	U
173	0206313M	Marine Corps Communications	7	49,208	96,293	96,153	U
199	0708730N	Maritime Technology (MARITECH)	7	18,392	21,551	9,366	U



## UNCLASSIFIED

Department of the Navy  
FY 2001 RDT&E Program  
Alphabetic Listing

Exhibit R-1

DATE: February 2000

APPROPRIATION: 1319n Research, Development, Test and Evaluation, Navy

		Thousands of Dollars					Security Classification
Line Number	Program Element Number	Item Nomenclature	Budget Activity	FY 1999	FY 2000	FY 2001	
175	0206624M	MC Combat Services Support	7	5,536	8,337	2,854	
174	0206623M	MC Ground Combat/Spt Arms Sys	7	16,235	28,679	22,124	U
169	0205632N	MK 48 ADCAP	7	16,597	20,314	15,853	U
196	0308601N	Naval Modeling & Simulation	7	0	12,054	9,106	U
194	0305927N	Navy Space Surv	7	378	1,708	2,038	U
172	0205675N	Operational Nuclear Power Systems	7	54,344	53,268	53,435	U
182	0303905N	Pisces	7	481,272	485,424	502,822	U
185	0303909N	Retract Redwood	7	65,701	0	30,161	U
178	0303109N	Satellite Communications (Space)	7	17,484	40,202	37,778	U
181	0303901N	SIRIUS	7	30,624	47,486	28,577	U
156	0101224N	SSBN Security/Survivability Program	7	29,574	33,055	31,173	U
155	0101221N	Strategic Sub & Weapons System Support	7	51,714	59,576	42,687	U
157	0101226N	Sub Acoustic Warfare Dev	7	7,871	3,178	879	U
168	0205620N	Surface ASW Combat Sys Integration	7	15,692	23,504	29,585	U
176	0207161N	Tactical Air Intercept	7	57,066	39,830	21,705	U
167	0205604N	Tactical Data Links	7	48,927	46,410	26,245	U
189	0305204M	Tactical UAV	7	5,959	0	0	U
190	0305204N	Tactical UAV	7	50,843	75,325	113,052	U
161	0204229N	Tomahawk & TMPC (R2/R3 Not Required/Prior Year Only)	7	149,793	141,417	91,436	U
Total Operational Systems Development				2,178,676	1,996,774	1,999,988	

Comparison of FY 1999 Financing as reflected  
in FY 2000 Budget with 1999 Financing as  
Shown in the FY 2001 Budget

	(\$ In Thousands)		
	<u>Financing per FY 2000 Budget</u>	<u>Financing Per FY 2001 Budget</u>	<u>Increase (+) or Decrease (-)</u>
Program Requirements (Service Account)	8,660,809	8,942,170	+ 281,361
Program Requirements (Reimbursable)	150,000	212,229	+62,229
<b>Appropriation (Adjusted)</b>	<b>8,810,809</b>	<b>9,154,399</b>	<b>+343,590</b>

Explanation of Changes in Financing  
(\$ in Thousands)

The Fiscal Year 1999 program has changed since the presentation of the FY 2000 budget as noted below:

1. Program Requirements (Total). There has been a net increase to the appropriation (adjusted) of +\$281,361 as a result of changes in program requirements as noted below.
2. Program Requirements (Service Account). There has been a net increase to the appropriation (adjusted) of \$281,361 which is a result of various changes. These changes include rescissions in the FY 2000 DoD Appropriations Act, specifically section 8058 (-\$14,900) and section 8090 (-\$40,900). Other changes are a result of reprogrammings which require congressional prior approval, including CH-60 (+\$4,000), OSCAR (+\$9,615), LASM (+\$6,900), ESSM (-\$22,672), JTCTS (+\$6,000), Combat Systems Integration (+\$18,000), Ship Self Defense (+\$4,000), and various classified programs (+\$275,000). Other transfers into or out of the account resulted in changes (-\$4,484). Internal realignments for Counter Terrorism (+\$8,000) and Counterdrug Operations (+\$32,802) are also included.
3. Program Requirements (Reimbursable). There has been a net increase to the appropriation of \$62,229, as a result of changes in reimbursable program requirements.

Comparison of FY 1999 Program Requirements as reflected  
in the FY 2000 Budget with FY 1999 Program Requirements  
as shown in the FY 2001 Budget

Summary of Requirements (\$ in Thousands)

	Total Program Requirements per FY 2000 <u>Budget</u>	Total Program Requirements per FY 2001 <u>Budget</u>	Increase (+) or Decrease (-)
01 – Basic Research	361,499	354,017	-7,482
02 – Applied Research	566,801	550,569	-16,232
03 – Advanced Technology Development	593,176	569,903	-23,273
04 – Demonstration and Validation (DEMVAL)	2,408,520	2,427,114	+18,594
05 – Engineering and Manufacturing Development (EMD)	2,199,737	2,134,903	- 64,,834
06 – RDTE Management Support	598,664	726,989	+128,325
07 – Operational Systems Development	1,932,412	2,178,675	+246,263
<b>Total Fiscal Year Program</b>	<b>8,660,809</b>	<b>8,942,170</b>	<b>+281,361</b>

Explanation by Budget Activity  
(\$ in Thousands)

01. Basic Research (-\$7,482) Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (-\$5,782), rescissions reflected in the FY 2000 DoD Appropriation Act (-\$1,642) and other changes in program requirements which required minor reprogrammings (-\$58).
02. Applied Research (-\$16,232) Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (-\$7,215). Other changes included rescissions reflected in the FY 00 DoD Appropriation Act (-\$2,581) and other changes in program requirements which required minor reprogrammings (-\$6,436).

03. Advanced Technology Development (-\$23,273) Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (-\$8,363). These changes included rescissions reflected in the FY 2000 DoD Appropriation Act (-\$2,600), a transfer to Defense-wide R&D for USACOM Joint Experimentation (-\$15,900) other changes in program requirements which required minor reprogrammings (+\$3,590).
04. Demonstration and Validation (DEM/VAL) (+\$18,594) - Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (-\$32,812), transfers to support the Counter Drug program (+\$24,802), change in program requirements (+\$7,461), FY 2000 DoD Appropriation Act rescissions (-\$14,946) and other changes in program requirements which required minor reprogrammings (+\$34,089).
05. Engineering and Manufacturing Development (EMD) (-\$64,834) Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (-\$52,462), transfers to support the Smart Work/TOC initiatives (+\$1,554), an adjustment realigning COSSI funds from BA-5 to BA-7 (-\$15,208), OSCAR (+\$9,615), CH-60 reprogramming (+\$4,000), a FY 2000 DoD Appropriation Act rescissions (-\$10,162), and other changes in program requirements which required minor reprogrammings, budget activity realignments and accounting updates (-\$3,798).
06. RDTE Management Support (+\$128,325) - Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (+\$121,893), a FY 2000 DoD Appropriation Act rescissions (-\$2,709), other changes in program requirements which required minor reprogrammings, budget activity realignments and accounting updates (+\$5,747) and a transfer for Federal Technology (+\$2,945).
07. Operational Systems Development (-\$246,263) - Changes to this budget activity resulted from a transfer to support the Small Business Innovative Research (SBIR) program (-\$23,153), an internal reprogramming into the classified programs (+\$275,000), the Counter-Terrorism Supplemental (+\$8,000) and JTCTS (+\$6,000). These changes also included rescissions reflected in the FY 2000 DoD Appropriations Act (-\$21,160), and other changes in program requirements which required minor reprogrammings, budget activity realignments and accounting updates (-\$1,576).

Comparison of FY 2000 Financing as reflected  
in FY 2000 Budget with 2000 Financing as  
Shown in the FY 2001 Budget

	(\$ In Thousands)		
	<u>Financing per FY 2000 Budget</u>	<u>Financing Per FY 2001 Budget</u>	<u>Increase (+) or Decrease (-)</u>
Program Requirements (Service Account)	7,984,016	9,056,644	+1,072,628
Program Requirements (Reimbursable)	150,000	198,500	+48,500
<b>Appropriation (Adjusted)</b>	<b>8,134,016</b>	<b>9,255,144</b>	<b>+1,121,128</b>

Explanation of Changes in Financing  
(\$ in Thousands)

The Fiscal Year 2000 program has changed since the presentation of the FY 2001 budget as noted below:

1. Program Requirements (Total). There has been a net increase to the appropriation (adjusted) of +\$1,072,628, result of changes in program requirements as noted below.
2. Program Requirements (Service Account). There has been a net increase to the appropriation (adjusted) of \$1,072,628, as a result of various changes. These changes included rescissions reflected in the FY 2000 DoD Appropriations Act (-\$46,821) and specific FY 2000 Congressional adjustments to start, continue, discontinue, reduce or earmark 205 specific initiatives (including transfers, which resulted in a net increase of \$1,126,310). Reprogramming actions which require congressional prior approval are also included, such as a transfer of funds for the USACOM Joint Experimentation program (+\$1,900), which is managed by the Navy as DoD executive agent, and a transfer to Defense-Wide Chemical/Biological (Chem/Bio) (-\$18,200). Internal reprogrammings actions impacting the FY 2000 program include Electronic Warfare Development (+\$10,000). Also, other changes in program requirements, phasing, or pricing resulted in transfers into or out of the account (-\$561).
3. Program Requirements (Reimbursable). There has been a net increase to the appropriation of +\$48,500, as a result of changes in reimbursable program requirements (+\$48,500).

Comparison of FY 2000 Program Requirements as reflected  
in the FY 2000 Budget with FY 2000 Program Requirements  
as shown in the FY 2001 Budget

Summary of Requirements (\$ in Thousands)

	Total Program Requirements per FY 2000 <u>Budget</u>	Total Program Requirements per FY 2001 <u>Budget</u>	Increase (+) or Decrease (-)
01 – Basic Research	376,748	374,301	-2,447
02 – Applied Research	523,839	622,394	+98,555
03 – Advanced Technology Development	519,523	753,631	+234,108
04 – Demonstration and Validation (DEM/VAL)	2,086,062	2,366,852	+280,790
05 – Engineering and Manufacturing Development (EMID)	1,953,882	2,301,795	+347,913
06 – RDTE Management Support	646,489	641,017	-5,472
07 – Operational Systems Development	1,877,473	1,996,654	+119,181
<b>Total Fiscal Year Program</b>	<b>7,984,016</b>	<b>9,056,644</b>	<b>+1,072,628</b>

Explanation by Budget Activity  
(\$ in Thousands)

01. Basic Research (-\$2,447) - Changes to this budget activity resulted from the rescissions found in the FY 2000 DoD Appropriations Act (-\$2,447).

02. Applied Research (+\$98,555) - These changes included specific FY 2000 Congressional adjustments to start, continue, discontinue, reduce or earmark 35 specific initiatives (including transfers) which resulted in a net increase (+\$102,010). Additionally, this change reflects rescissions found in the FY 2000 Appropriations Act (-\$3,455).

03. Advanced Technology Development (+\$234,108) - These changes included specific FY 2000 Congressional adjustments to start, continue, discontinue, reduce or earmark 14 specific resulting initiatives (including transfers), which resulted in a net increase (+\$235,400), as well as the rescissions reflected in the FY 2000 Appropriations Act (-\$4,194). Additionally, FY 2000 includes a transfer for the USACOM Joint Experiments program (+\$1,900) and other changes in program requirements which required minor reprogrammings (+\$1,002).
04. Demonstration and Validation (DEM/VAL) (+\$280,790) - These changes included specific FY 2000 Congressional adjustments to start, continue, discontinue, reduce or earmark 49 specific initiatives (including transfers), which resulted in a net increase (+\$287,300) as well as the rescissions reflected in the FY 2000 Appropriations Act (-\$11,841). Additionally, FY 2000 includes changes in program requirements which required minor reprogrammings (+\$5,331).
05. Engineering and Manufacturing Development (EMD) (+\$347,913) - These changes included specific FY 2000 Congressional adjustments to start, continue, discontinue, reduce or earmark 40 specific initiatives (including transfers), which resulted in a net increase of (+\$367,139), as well as rescissions reflected in the FY 2000 Appropriations Act (-\$11,910). Additionally, changes in program requirements which required minor reprogrammings are reflected (-\$7,316).
06. Management Support (-\$5,472) - These changes included specific FY 2000 Congressional adjustments to start, continue, discontinue, reduce or earmark 13 specific initiatives (including transfers), which resulted in a net increase of (+\$24,300), as well as rescissions reflected in the FY 2000 Appropriations Act (-\$1,784). Other decreases included a transfer to Defense-wide Chem/Bio (-\$18,200) and changes in program requirements which required minor reprogrammings (-\$9,788).
07. Operational Systems Development (+\$119,181) - These changes included specific FY 2000 Congressional adjustments to start, continue, discontinue, reduce or earmark 28 specific resulting initiatives (including transfers), which resulted in a net increase (+\$131,200), as well as rescissions reflected in the FY 2000 Appropriations Act (-\$11,190). Additionally, changes in program requirements which required minor reprogrammings (-\$829).

**UNCLASSIFIED**

**EXHIBIT R-2, FY 2001 PRESIDENT'S BUDGET ITEM JUSTIFICATION SHEET**

**DATE: FEBRUARY 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0604227N**

**PROGRAM ELEMENT TITLE: Harpoon Modifications**

**( U ) COST: (Dollars in Thousands)**

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>Complete</u>	<u>To</u>	<u>Total Program</u>
A1843 HARPOON	989								0	0
<b>TOTAL</b>	<b>989</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**( U ) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:**

( U ) A1843/HARPOON MODIFICATIONS Description: The Harpoon Block II Weapon System program was intended to upgrade and expand the capabilities of the U.S. Navy's only anti-ship missile to improve its precision in a congested littoral environment. The Navy funding for the program was canceled during POM-00 resulting in the Navy's withdrawal from further direct participation. FY-99 RDT&E funding was utilized to conduct an operational cost analysis of available ship attack weaponry for application as a possible successor to Harpoon Block IC.

( U ) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

**R-1 Item No. 155  
UNCLASSIFIED**



**UNCLASSIFIED**

**EXHIBIT R-2, FY 2001 PRESIDENT'S BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: FEBRUARY 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0604227N**

**PROGRAM ELEMENT TITLE: Harpoon Modifications**

**1. FY 1999 PLAN**

- ( U ) (\$ 989) Completed operational cost analysis of available ship attack weaponry versus upgrades to Harpoon Block IC to include non-recurring and total life cycle costs.

**2. FY 2000 PLAN:**

- ( U ) (\$ 0)

**3. FY 2001 PLAN:**

- (U) (\$ 0)

**R-1 Item No. 155  
UNCLASSIFIED**

**UNCLASSIFIED**

**EXHIBIT R-2, FY 2001 PRESIDENT'S BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: FEBRUARY 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0604227N**

**PROGRAM ELEMENT TITLE: Harpoon Modifications**

**( U ) B. PROGRAM CHANGE SUMMARY**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
( U ) FY 2000 President's Budget:	1954	0	0
( U ) Appropriated Value:	1965		
( U ) Adjustments from President's Budget:	-965		
( U ) FY 2001 President's Budget Submit:	989	0	0

**CHANGE SUMMARY EXPLANATION:**

( U ) Funding: The FY 1999 net decrease of \$965 thousand reflects a \$9 thousand reduction for revised economic assumptions, a \$1 thousand reduction for a SBIR assessment, and a decrease of \$955 thousand for a reprioritization of requirements within the Navy.

( U ) Schedule: N/A

( U ) Technical: N/A

( U ) C. OTHER PROGRAM FUNDING SUMMARY: N/A

Related RDT&E: N/A

( U ) D. ACQUISITION STRATEGY: This is a non-ACAT program with no specific acquisition strategies.

( U ) E. SCHEDULE PROFILE: N/A

**R-1 Item No. 155  
UNCLASSIFIED**

# UNCLASSIFIED

APPROPRIATION/BUDGET ACTIVITY		Exhibit R-2, RDT&E Budget Item Justification		Date: Feb 2000
RDT&E, N - BA7		Program Element Name & No. PE 0101221N, Strategic Sub & Weapons System Support		

Cost (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total PE Cost	51.7	59.6	42.7	43.6	37.0	38.3	45.2	CONT.	CONT.
J0951 TRIDENT II	9.7	9.0	9.6	9.7	1.5	1.5	1.6	CONT	CONT
S0004 TRIDENT Submarine System Improvement	6.2	2.2	.6	.6	1.5	1.9	7.8	CONT	CONT
J2228 Technology Applications Program	35.8	48.4	32.5	33.3	34.0	34.9	35.8	CONT	CONT
RDT&E Articles									
Qty									

## A. (U) Mission Description and Budget Item Justification:

The TRIDENT II (D5) Submarine Launched Ballistic Missile (SLBM) provides the U.S. a weapon system with greater accuracy and payload capability as compared to the TRIDENT I (C4) system. TRIDENT II enhances U.S. strategic deterrence providing a survivable sea-based system capable of engaging the full spectrum of potential targets with fewer submarines. This PE supports continued evaluation of the system's long range performance and capabilities as well as investigations into new technologies which would help mitigate the program impact due to component obsolescence and a rapidly decreasing manufacturing support base. Efforts also include Reentry System and Guidance System Applications efforts. The TRIDENT Submarine System Improvement Program develops and integrates command and control improvements needed to maintain TRIDENT Submarine operational capability through the life cycle of this vital strategic asset. The program conducts efforts needed to maintain strategic connectivity, ensure platform invulnerability, and reduce lifecycle costs through Obsolete Equipment Replacement (OER) and commonality.

## (U) JUSTIFICATION FOR BUDGET ACTIVITY:

This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for operational systems.

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Exhibit R-2 RDT&E Budget Item  
(Exhibit R-2)

# UNCLASSIFIED

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Exhibit R-2, RDT&E Budget Item Justification		Date: Feb 2000
APPROPRIATION/BUDGET ACTIVITY	Program Element Name & No.	
RDT&E,N - BA7	PE 0101221N, Strategic Sub & Weapons System Support	

## B. (U) Program Change Summary:

### FY 2000 President's Budget:

Adjustments from FY 2000 President's Budget to Appropriated Value

FY1999	FY 2000	FY 2001
56.5	45.9	45.3

13.7

### Appropriated Value:

56.5	59.6	N/A
------	------	-----

Adjustments to FY 1999 Appropriated value & FY 2000 President's Budget

-2.6

-4.8

FY 2001 President's Budget Submit:

51.7	59.6	42.7
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Explanation: Changes from FY 2000 President's Budget to FY 2000 Appropriated In FY 2000 project J2228 was granted a Congressional plus up of +\$14.0 for RADHARD electronics work in the Guidance Applications effort, which was partially offset by a - \$3.3 across the board reduction. Also, \$1.028 of the extramural program is reserved for the SBIR assessment IAW 15 USC 638.

FY 2001 President's Budget changes: For all projects in FY 1999 there are SBIR assessments of -\$1.1. For project S0004 in FY 1999 there were reductions of -\$1.1 for a combination of Congressional revised economic assumptions, midyear review BTR civilian personnel underexecution adjustments, and other miscellaneous adjustments. For project J2228 in FY 1999 there was a Below Threshold sponsor generated Reprogramming of -\$1.9, inflation savings of -\$3.3, and a transfer out of -\$3.3 to finance 1% closed account billings. Project J0951 also had a transfer out in FY 1999 of -\$1.1 for closed account billings. In FY 2001, Project J2228 was reduced by -\$3.0 for affordability reasons in the area of Technology Applications, -\$2.2 for inflation, and Project S0004 was increased \$0.6 for Architecture Model Maintenance.

C. (U) Other Program Funding Summary: See enclosed R-2a for each individual project data.

D. (U) Acquisition Strategy: See enclosed R-2a for each individual project data.

E. (U) Schedule Profile: Not Applicable.

R-1 Item No 157 - 2 of 157 - 18

Exhibit R-2 RDT&E Budget Item  
(Exhibit R-2)

# UNCLASSIFIED

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Exhibit R-2a, RDT&E Project Justification		Date: Feb 2000
APPROPRIATION/BUDGET ACTIVITY	Program Element Name & No.	Project Name and Number.
RDT&E, N - BA7	PE 0101221N, Strategic Sub & Weapons System Support	TRIDENT II - J0951

Cost (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	9.7	9.0	9.6	9.7	1.5	1.5	1.6	CONT.	CONT.
J0951 TRIDENT II									
RDT&E Articles									
Qty									

## A. (U) Mission Description and Budget Item Justification:

The TRIDENT II (D5) Submarine Launched Ballistic Missile (SLBM) provides the U.S. a weapon system with greater accuracy and payload capability as compared to the TRIDENT I (C4) system. TRIDENT II enhances U.S. strategic deterrence by providing a survivable sea-based system capable of engaging the full spectrum of potential targets with fewer submarines. This project supports continued evaluation of the system's long range performance and capabilities as well as investigations into new technologies which would help mitigate the program impact due to component obsolescence and a rapidly decreasing manufacturing support base.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

R-1 Item No 157 - 3 of 157 - 18

Exhibit R-2a RDT&E Project Justification  
(Exhibit R-2a)

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APPROPRIATION/BUDGET ACTIVITY RDT&E,N - BA7	Exhibit R-2a, RDT&E Project Justification Program Element Name & No. PE 0101221N, Strategic Sub & Weapons System Support	Project Name and Number. TRIDENT II - Jo951	Date: Feb 2000
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## 1. (U) FY 1999 Accomplishments:

- (U) (\$9.3) SRS: Effort continued in support of phase three development of the SLBM Retargeting System. Full obligation has been achieved.
- (U) (\$.4) This represents funding utilized to finance closed account billings. Full obligation has been achieved.

## 2. (U) FY 2000 PLAN:

- (U) (\$8.2) SRS:.. Effort continues in support of phase three development of the SLBM Retargeting System. Full obligation is projected by 3<sup>rd</sup> quarter of the 1<sup>st</sup> year.
- (U) (\$.8) This represents funding utilized to finance closed account billings. Full obligation is projected by the end of the fiscal year.

## 3. (U) FY 2001 PLAN:

- (U) (\$8.7) SRS:.. Effort continues in support of phase three development of the SLBM Retargeting System. Full obligation is projected by 3<sup>rd</sup> quarter of the 1<sup>st</sup> year.
- (U) (\$.9) This represents funding utilized to finance closed account billings. Full obligation is projected by the end of the fiscal year.

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Exhibit R-2a RDT&E Project Justification  
(Exhibit R-2a)

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APPROPRIATION/BUDGET ACTIVITY	Exhibit R-2a, RDT&E Project Justification	Date: Feb 2000
RDT&E,N - BA7	Program Element Name & No. PE 0101221N, Strategic Sub & Weapons System Support	Project Name and Number. TRIDENT II - Jo951

B. (U) Other Program Funding Summary: (Dollars in Thousands)

# Programt

(U) Related RDT&E: N/A

C. (U) Acquisition strategy:

Contracts will continue to be awarded to those sources who were engaged in the TRIDENT II (D5) development program and are currently engaged in the production and/or operational support of the deployed D5/C4 Strategic Weapons Systems on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 ©(1) and (3) implemented by FAR 6.302.-1, 3 4.

D. (U) Schedule Profile: Not Applicable.

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Exhibit R-2a RDT&E Project Justification  
(Exhibit R-2a)

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Exhibit R-3, Cost Analysis (APPROPRIATION/BUDGET ACTIVITY ROT&E,N - BA7	Program Element Name & No. PE 0101221N, Strategic Sub & Weapons System Support	Project Name and Number. TRIDENT II - J0951	Date: Feb 2000
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R-1 Item No 157 - 6 of 157 - 18  
Exhibit R-3 RDT&E Project Justification  
(Exhibit R-3)

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Exhibit R-2a, RDT&E Project Justification		Date: Feb 2000
APPROPRIATION/BUDGET ACTIVITY	Program Element Name & No.	Project Name and Number.
RDT&E,N - BA7	PE 0101221N, Strategic Sub & Weapons System Support	Technology Applications - J2228

Cost (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost	35.8	48.4	32.5	33.3	34.0	34.9	35.8	CONT.	CONT.
J2228 Technology Applications Program									
RDT&E Articles									
Qty									

A. (U) Mission Description and Budget Item Justification:

This supports implementation of a coordinated Air Force/Navy Reentry System Applications Program as well as the implementation of a Strategic Guidance Applications Program. Reentry Vehicle and Guidance Technology is rapidly eroding beyond the point of being capable to respond to increasing aging phenomena and future requirements. The Nuclear Posture Review examined the infrastructure which supports the nuclear force structure. It concluded that special actions were required to correct the rapidly eroding capability to maintain confidence in the existing weapon systems, and recommended that the reentry vehicle and guidance technology bases should be preserved. That recommendation resulted in the Presidential Decision Directive-30, which directed that programs be established for the reentry vehicle and guidance technology application.

- Through sustainment of the Reentry Vehicle Technology Base, confidence in the dependability and reliability of Strategic SLBM and ICBM weapon systems will be maintained over the long term when no new systems will be in development. Critical and unique attributes necessary for the design, development and in-service support of current and modernized SLBM Reentry Systems will be defined and maintained to insure a functioning readiness application technical capability in reentry is preserved. Working closely with the Air Force, Navy requirements will be integrated with the Air Force requirements into a comprehensive program. The Program will maintain close coordination with the DOD Science and Technology (S&T) Community through the Reliance process in order to: Leverage S&T programs, ensure system driven technology base requirements are considered in contract awards, eliminate duplication of effort and provide an opportunity to demonstrate appropriate emerging technologies through a reentry flight test evaluation process.

- This Program provides a minimum Strategic Guidance core technology development capability consistent with the Strategic Advisory Group (SAG) recommendations to CINCSSTRAT. In the SAG recommendations SSP is to establish a program which preserves this critical design and development core. It is a basic bridge program which develops critical guidance technology applicable to any of the existing Air Force/Navy Strategic Missiles. The objective is to transition from current capability to a long term readiness status required to support deployed systems. Air Force and Navy guidance technology requirements shall be integrated and needs prioritized. Efforts shall be focused on alternatives to currently utilized technologies identified as system "weak links". Current system accuracy and functionality depends upon key technologies which provide radiation hardened velocity, attitude and stellar sensing capabilities. As the underlying technologies that currently provide these capabilities age and are no longer technically supportable modern alternatives must be made available in order to allow for orderly replacement. There is no commercial market for these technologies and their viability depends on the strategic community. This technology

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Exhibit R-2a RDT&E Project Justification  
(Exhibit R-2a)

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Exhibit R-2a, RDT&E Project Justification		Date: Feb 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E,N - BA7	Program Element Name & No. PE 0101221N, Strategic Sub & Weapons System Support	Project Name and Number. Technology Applications - J2228

development activity provides the necessary technical challenges which insures the availability of a proficient team of technical experts. The availability and maintenance of these skills and experience of these experts are crucial to the support of the nation's Strategic Guidance Systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 Accomplishments
  - (U) (\$19.7) Continued Reentry System Applications Program. The effort is fully obligated. FY 1999 efforts included:
    - (U) Conducted ground testing of reentry vehicle candidate materials including those available from Science & Technology (S&T).
    - (U) Initiated down-select process of low-cost candidate replacement materials.
    - (U) Initiated procurement and testing of reentry hardware components exposed to operational environments beyond their design life.
    - (U) Maintained RSAP technical program plan, conduct system assessments and identify tools to conduct Vulnerability & Hardening certification in absence of Nuclear Underground Testing (UGT) facilities.
    - (U) Continued development of instrumentation for flight test applications.
    - (U) Demonstrated developed Arming, Fuzing & Firing (AF&F) instrumentation.
    - (U) Initiated feasibility of low-cost replacement candidate for aging Mk4 AF&F.
  - (U) (\$16.1) Continued Strategic Guided Applications Program. The effort is fully obligated. FY 1999 efforts included:
    - (U) Structural (mechanical and thermal) and system performance was added to Integrated Engineering Environment (IEE) system functionality along with improved fidelity towards a "virtual" system capability in FY 2001. Continued expanding the hardware design support of Strategic Inertial Guidance Hardware Technology Synthesizer (SIGHTS) into other subsystems such as attitude and stellar and their associated hardware correlation. Delivered and began utilization of the "probes" initiated in FY 1997. Completed the prototype alternate FIGA design studies and test towards a Critical Design review. The completion of radiation testing of Interferometric Fiber Optic Gyro (IFOG) technology occurred in early FY 1998. Initiated evaluation of IFOG architecture solutions to radiation issues found in component testing (approximately two-year effort.) Procured alternate stellar sensors to TRIDENT II format. Continued the microprocessor effort.

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Exhibit R-2a RDT&E Project Justification  
(Exhibit R-2a)

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Exhibit R-2a, RDT&E Project Justification		Date: Feb 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, N - BA7	Program Element Name & No. PE 0101221N, Strategic Sub & Weapons System Support	Project Name and Number. Technology Applications - J2228

2. (U) FY 2000 Plan
- (U) (\$19.1) Continue Reentry System Applications Program. Full obligation is projected by the 3<sup>rd</sup> quarter of the 1<sup>st</sup> year. FY 2000 efforts include:
    - (U) Continue ground testing of reentry vehicle candidate materials including those available from Science & Technology (S&T).
    - (U) Continue down-select process of low-cost candidate replacement materials.
    - (U) Initiate planning and procurement of required hardware and instrumentation for demonstration of low-cost replacement heatshield.
    - (U) Initiate build-up of heavily instrumented flight unit for aged hardware evaluation.
    - (U) Continue ground testing of reentry components exposed to operational environments beyond their design life, and evaluate FY 1999 ground testing data.
    - (U) Maintain RSAP technical program plan, conduct system assessments and initiate Vulnerability & Hardening certification process in absence of Nuclear Under Ground Testing (UGT) facilities.
    - (U) Evaluate Arming, Fuzing & Firing (AF&F) flight data.
  - (U) (\$29.3) Continue Strategic Guidance Applications Programs (GAP). Full obligation is projected by the 3<sup>rd</sup> quarter of the 1<sup>st</sup> year. FY 2000 efforts include:
    - (U) Complete and more fully utilize the IEE virtual system capability. Continue with IEE/SIGHTS towards a "real time" hardware-in-loop simulation capability targeted for completion in late FY 2001. Begin to utilize the IEE/SIGHTS capability to perform system architecture/design tradeoffs. Initiate prototype alternate PIGA fabrication and subassembly testing.
    - (U) Continue IFOG work started in FY 1999. Initiate stellar subsystem prototype using English Electric Valve (EEV) or alternate sensor technology.
    - (U) Develop unique integrated circuits (IC) using radiation Hard Technology to be infused into Computer Aided Design tools. These RHICAD tools will provide the Navy with a capability to replace and develop new RADHARD components as required for strategic missiles and satellites.

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Exhibit R-2a RDT&E Project Justification  
(Exhibit R-2a)

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APPROPRIATION/BUDGET ACTIVITY		Exhibit R-2a, RDT&E Project Justification	Date: Feb 2000
RDTE, N - BA7	Program Element Name & No. PE 0101221N, Strategic Sub & Weapons System Support	Project Name and Number. Technology Applications - J2228	

## 3. (U) FY 2001 Plan

- (U) (\$17.9) Continue Reentry System Applications Program. Full obligation is projected by the 3rd quarter of the first year. FY 2001 efforts include:
  - (U) Continue ground testing of reentry vehicle candidate materials including those available from Science & Technology (S&T).
  - (U) Conduct low-cost replacement heatshield demonstration.
  - (U) Continue ground testing of reentry components exposed to operational environments beyond their design life.
  - (U) Evaluate aged hardware flight data.
  - (U) Maintain RSAP technical program plan, conduct system assessments and continue Vulnerability & Hardening certification process in absence of Nuclear Under Ground Testing (UGT) facilities.
- (U) (\$14.6) Continue Strategic Guidance Applications Programs (GAP). Full obligation is projected by the 3rd quarter of the 1<sup>st</sup> year. FY 2001 efforts include:
  - (U) Complete prototype fabrication and initiate component testing of alternate accelerometer, IFOG and stellar subsystem. Continue evaluation of circumvention alternatives at the system level.

## B. (U) Other Program Funding Summary: (Dollars in Thousands)

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005To	TOTAL
ESTIMATE	N/A	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	PROGRAM
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

(U) Related RDT&E: N/A

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Exhibit R-2a RDT&E Project Justification  
(Exhibit R-2a)

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APPROPRIATION/BUDGET ACTIVITY RDT&E, N - BA7	Exhibit R-2a, RDT&E Project Justification Program Element Name & No. PE 0101221N, Strategic Sub & Weapons System Support	Project Name and Number. Technology Applications - J2228	Date: Feb 2000
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## C. (U) Acquisition Strategy:

Contracts will continue to be awarded to those sources who were engaged in the TRIDENT II (D5) development program and are currently engaged in the production and/or operational support of the deployed D5/C4 Strategic Weapons Systems on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3 4.

## D (U) Schedule Profile: Not Applicable

R-1 Item No 157 - 11 of 157 - 18

Exhibit R-2a RDT&E Project Justification  
(Exhibit R-2a)

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Exhibit R-3 Cost Analysis	Date: Feb 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E,N - BA7	PROGRAM ELEMENT NAME AND NUMBER Strategic Submarine & Weapons System Support, PE 0101221N
	PROJECT NAME AND NUMBER Technology Applications J2228

Cost Categories	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
SUPPORT AND MANAGEMENT											
TECHNOLOGY APPLICATIONS	SS - CPFF	LMMS/CAL	16.4	9.1 10/98	9.0	10/99	7.0	10/00	CONT.	CONT.	CONT.
TECHNOLOGY APPLICATIONS	WR	NSWC/VA	12.2	7.2 10/98	5.4	10/99	7.1	10/00	CONT.	CONT.	CONT.
TECHNOLOGY APPLICATIONS	MIPR	DOE/NM	2.1	1.6 10/98	1.9	10/99	1.1	10/00	CONT.	CONT.	CONT.
TECHNOLOGY APPLICATIONS	SS - CPFF	CSDL/MA	0.2	1.2 10/98	2.2	10/99	2.1	10/00	CONT.	CONT.	CONT.
TECHNOLOGY APPLICATIONS	SS - CPFF	KAMAN/CO	1.6	0.6 10/98	0.6	10/99	.6	10/00	CONT.	CONT.	CONT.
TECHNOLOGY APPLICATIONS	SS - CPFF	CSDL/MA	30.1	16.1 10/98	29.3	10/99	14.6	10/00	CONT.	CONT.	CONT.
Subtotal Support			62.6	35.8	48.4		32.5				

Remarks

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Exhibit R-3 Project Cost Analysis  
(Exhibit R-3)

# UNCLASSIFIED

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2000				
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER						
RDT&E, NIBA-7	Strategic Sub & Wpns Sys Spt 0101221N			TRIDENT Submarine System Improvement/S0004						
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		6.2	2.2	0.6	0.6	1.5	1.9	7.8	CONT.	CONT.
RDT&E Articles Qty										

## A. (U) Mission Description and Budget Item Justification:

The TRIDENT Submarine System Improvement Program develops and integrates command and control improvements needed to maintain TRIDENT submarine operations capability through the life cycle of this vital strategic asset. The program conducts efforts needed to maintain strategic connectivity, ensure platform invulnerability, and reduce life cycle costs through Obsolete Equipment Replacement (OER) and commonality.

## (U) Program Accomplishments and Plans:

1. (U) FY 1999 Accomplishments:
  - (U) (\$3.310) Completed development of TRIDENT CCS MK2 Block 1C DWS Program.
  - (U) (\$2.330) Continued development of ARCI Phase I/II MPP Program.
  - (U) (\$0.554) Continued Architecture Model Maintenance and COTS Technical Refresher.

R-1 SHOPPING LIST - Item No. 157-13 of 157-18

Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a)

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification				DATE:		February 2000				
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER								
RDT&E, N/BA-7	Strategic Sub & Wpns Sys Spt 0101221N	TRIDENT Submarine System Improvement/S0004								
2. (U) FY 2000 Plan:										
- (U) (\$506)	Complete development of ARCI Phase I/II MPP Program.									
- (U) (\$1.505)	Continue Architecture Model Maintenance and COTS Technical Refresher.									
3. (U) FY 2001 Plan: Not applicable.										
FY 2000 President's Budget		FY 1999	FY 2000	FY 2001						
Appropriated Value:		7.414	2.200			0.600				
Adjustment to FY 1999/2000 Appropriated Value/		7.414								
FY 2000 President's Budget		-1.220								
FY 2001 DON Budget Submit		6.194	2.188			0.595				
(U) Funding: The total decrease of \$1.220M is the result of minor pricing adjustments and a \$0.479 midyear reduction..										
(U) Schedule: Not applicable.										
(U) Technical: Not applicable.										
C. (U) Other Program Funding Summary:										
	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
267600/267606 (BA-2) Strategic Platform Support Equipment	7.172	12.499	24.727	15.356	11.390	20.235	24.982	12.683	CONT.	CONT.
535500/5335506 (BA-4) Strategic Platform Support Equipment	2.258	2.942	9.307	2.901	11.936	8.468	2.193	4.634	CONT.	CONT.

R-1 SHOPPING LIST - Item No. 157-14 of 157-18

Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a)

# UNCLASSIFIED



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EXHIBIT R-2a, RDT&E Project Justification			DATE:	February 2000
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER		
RDT&E, NIBA-7	Strategic Sub & Wpns Sys Spt 0101221N	TRIDENT Submarine System Improvement/S0004		
(U) Related RDT&E: These PEs develop submarine software and hardware that are directly related to efforts conducted by the program element.				
(U) PE 0101224N (SSBN Security Survivability Program)				
(U) PE 0101402N (Navy Strategic Communications)				
(U) PE 0604562N (Submarine Tactical Warfare System)				
(U) PE 0604503N (Submarine System Equipment Development)				
D. (U) Acquisition Strategy:				
The TRIDENT operational systems development program results in improvements to the baseline TRIDENT Combat System. Current TRIDENT Combat Systems were first developed in the early 1970s and are becoming increasingly difficult to maintain and offer comparatively less performance than more recently designed systems. Previous efforts to upgrade portions of the TRIDENT Combat System include improvements via sonar and combat control hardware and software (e.g., QE2 programs), feasibility of increased countermeasure capability and a concept evaluation of a Submarine Force Mission Program Library (SFMPL) interface. Due to the sensitivity of TRIDENT programs it is assessed that international technology will not have a major impact or be a recipient of the benefits derived from this effort. Development strategies will significantly enhance the sustainability and operability of the sonar, communications and Combat Control Systems on TRIDENTs by evaluating both OER possibilities and potential improvements.				
E. (U) Schedule Profile:				
Successful program development will lead to the submission and approval of system and subsystem Engineering Changes for installation during SSBN 726 class submarine backfits. Specific deliverable dates for the RDT&E,N and OP,N programs are:				
Adv Rapid COTS Insertion (ARCI) Phase I/II - FY97 (2nd Qtr) – Program Inception				
FY00 (4th Qtr) – Install and Test Prototype				
FY02 (1st Qtr) – ARCI Certification/IOC				
Combat Control System (CCS) MK2 Block 1C - FY98 (2nd Qtr) – Program Inception				
FY00 (4th Qtr) – Install and Test Prototype				
FY02 (1st Qtr) – Certification/IOC				

R-1 SHOPPING LIST - Item No. 157-15 of 157-18

Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a)

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE:	February 2000
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER		
<b>RD&amp;E, N/BA-7</b>	<b>Strategic Sub &amp; Wpns Sys Spt 0101221N</b>	TRIDENT Submarine System Improvement/S0004		
Architecture Model Maint. & COTS Technology Refresh -	FY98 (2nd Qtr) – Program Inception FY00 – CONT. – COTS Supportability, Architecture Maintenance and COTS Management Processes			
Q6 to Q5 Translator -	FY98 (2nd Qtr) – Program Inception; Installation and Test; Certification/IOC			

R-1 SHOPPING LIST - Item No. 157-16 of 157-18

Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a)

# UNCLASSIFIED

CLASSIFICATION:

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Exhibit R-3 Cost Analysis (page 1)				DATE:		February 2000					
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT		PROJECT NAME AND NUMBER						
RDT&E, N/BA-7			Strategic Sub & Wpns Sys Spt 0101221N		TRIDENT Submarine System Improvement/S0004						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY \$ Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Total Cost	Target Value of Contract
Primary Hardware Development										0.000	
Ancillary Hardware Development										0.000	
Systems Engineering										0.000	
Design/Development Engineering	SS-CPIF	Raytheon, Portsmouth RI	2.600	3.310	12/98	0.000	N/A			5.910	5.910
Software Development	WR	NUWC, Newport RI	0.600	0.000	N/A	0.000	N/A			0.600	0.600
Design/Development Engineering	SS-CPFF	Lockhead Martin, Manassas VA	2.300	2.330	12/98	0.506	12/99			5.136	5.500
Design/Development Engineering	Various	Various	11.700	0.000	N/A	0.000	N/A			11.700	11.700
Licenses										0.000	
Tooling										0.000	
GFE										0.000	
Award Fees										0.000	
Subtotal Product Development			17.200	5.640		0.506		0.000		23.346	23.710
Remarks:											
Development Support Equipment										0.000	
Software Development										0.000	
Training Development										0.000	
Integrated Logistics Support										0.000	
Configuration Management										0.000	
Support and Management	Various	Various	0.020	0.000	N/A	0.177	N/A	0.005		0.202	0.202
Technical Data										0.000	
GFE										0.000	
Subtotal Support			0.020	0.000		0.177		0.005		0.202	0.202
Remarks: 0.646 includes 0.167 and 0.479.											

R-1 SHOPPING LIST - Item No. 157-17 of 157-18

Exhibit R-3, Project Cost Analysis  
(Exhibit R-3)

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)		DATE:		February 2000							
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT		PROJECT NAME AND NUMBER							
RDT&E, N/BA-7		Strategic Sub & Wpns Sys Spt 0101221N		TRIDENT Submarine System Improvement/S0004							
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NUWC, Newport RI	0.300	0.554	10/98	1.505	10/99	0.590	CONT.	0.000	CONT.
Test and Certification	Various	Various	0.700	0.000	N/A	0.000	N/A		0.000	0.700	0.700
Operational Test & Evaluation	Tooling								0.000	0.000	
GFE									0.000	0.000	
Subtotal T&E			1.000	0.554		1.505		0.590	0.000	3.649	
Remarks: After transition to Commercial Off-The-Shelf (COTS) based systems, obsolescence becomes a major issue. To keep current, it is necessary to support the development and maintenance of a RDT&E process to maintain TRIDENT subsystems using commercial technology and parts. This model will continue the evaluation and implementation of COTS Technology.											
Contractor Engineering Support										0.000	
Government Engineering Support										0.000	
Program Management Support										0.000	
Travel										0.000	
Labor (Research Personnel)										0.000	
Overhead										0.000	
Subtotal Management			0.000	6.194		2.188		0.595	0.000	8.977	
Remarks: Government Furnished Property - not applicable.											
Total Cost			18.220	12.388		4.376		0.600	CONT.	CONT.	CONT.
Remarks:											

R-1 SHOPPING LIST - Item No. 157-18 of 157-18

Exhibit R-3, Project Cost Analysis  
(Exhibit R-3)

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CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification									
DATE: February 2000									
APPROPRIATION/BUDGET ACTIVITY									
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/JBA-7									
R-1 ITEM NOMENCLATURE									
Program Element (PE) Name and No. Submarine Acoustic Warfare Development/0101226N									
COST (\$ in Millions)	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Total Cost
Total PE Cost		7.871	3.178	0.879	0.997	1.103	3.089	8.891	CONT.
Submarine Defensive Warfare/V1265		7.871	3.178	0.879	0.997	1.103	3.089	8.891	CONT.
Quantity of RDT&E Articles									

A. Mission Description and Budget Item Justification: This project develops a Submarine Defensive Warfare System (SDWS) to improve the effectiveness and survivability of all classes of US submarines. Project efforts consist of a new acoustic threat intercept system (AN/WLY-1) that will have threat platform sonar and torpedo recognition capability for early detection, classification, and tracking of threats. It will allow radius of curvature and multipath ranging. The system will also include a control subsystem for launch management of all onboard countermeasure devices and launchers. Next Generation Countermeasure (NGCM) including Weapons Analysis Facility (WAF) simulation analysis capability provides the US Navy with testing of hardware and software within detailed representations of acoustic environments.

1. (U) FY 1999 Accomplishments:
  - (\$7.871) Completed sensor and software development and continued Phase II design review.
2. (U) FY 2000 Plan:
  - (\$3.178) Complete Phase II Design Review and conduct TECHEVAL/OPEVAL for the AN/WLY-1 system.
3. (U) FY 2001 Plan:
  - (.879) Perform WAF, Threat Weapon Vulnerability and Countermeasure Effectiveness Analysis.

R-1 SHOPPING LIST - Item No. 159 - 1 of 159 - 5

Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, page 1 of 5)

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R-1 SHOPPING LIST - Item No. 159 - 2 of 159 - 5

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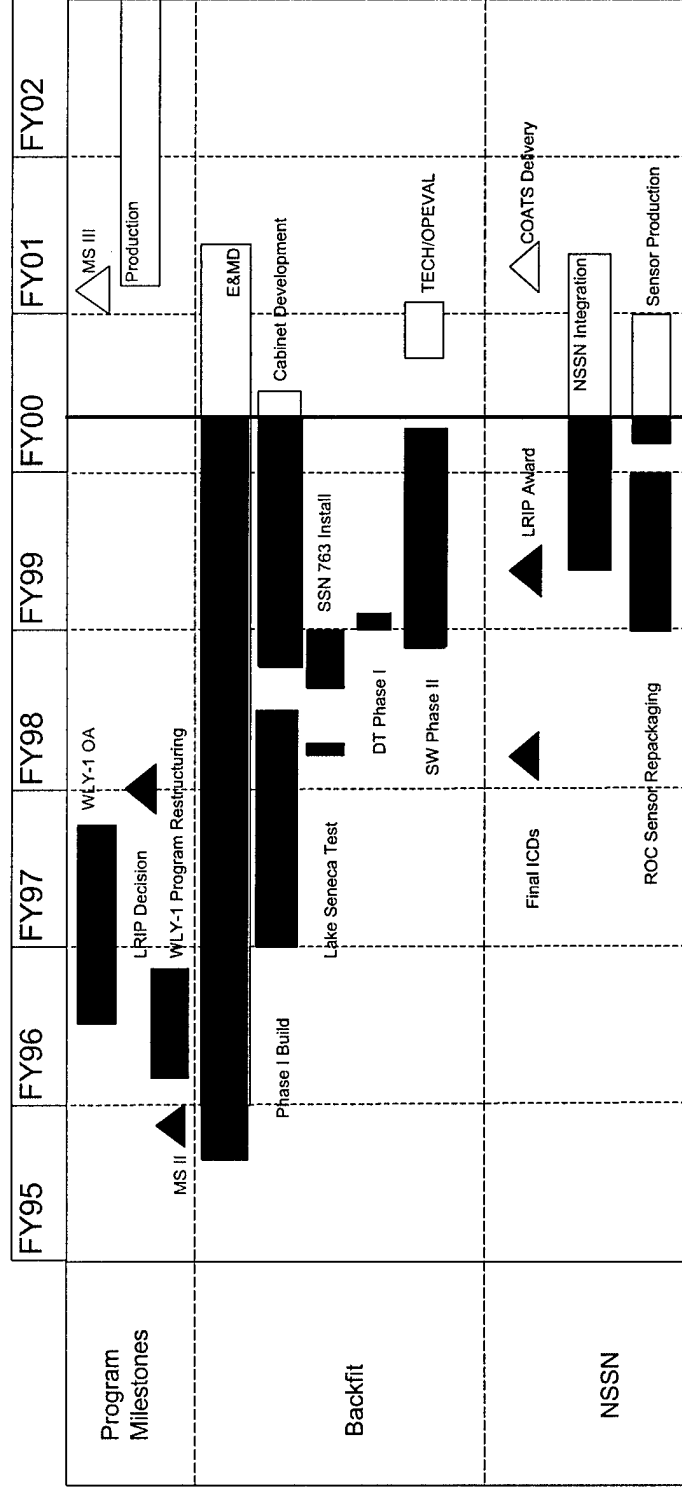
**UNCLASSIFIED**

DATE:

February 2000

R-1 ITEM NOMENCLATURE

RESEARCH DEVELOPMENT TEST &amp; EVALUATION, NAVY//BA-7



R-1 SHOPPING LIST - Item No. 159-3 of 159 - 5

**Exhibit R-2, RDT&E Budget Item Justification**  
(Exhibit R-2, page 3 of 5)

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CLASSIFICATION:

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Exhibit R-3 Cost Analysis (page 1)				DATE:		February 2000					
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT		PROJECT NAME AND NUMBER							
RDT&E, NIBA-7		Sub Acoustic Warfare Dev/0101226N		Submarine Defensive Warfare Systems/V1265							
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Award Date	FY 01 Award Date	FY 01 Cost	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPAF	Northrop Grum Melville, NY	31,500	4,045	12/98	1,367	01/00		0.000	36,912	36,912
Ancillary Hardware Development										0.000	
Systems Engineering	C/CPAF	General Dyn Groton, CT	4,778	0.000		0.000			0.000	4,778	5,717
Systems Engineering	WR	PNSY	0.730	0.000		0.000			0.000	0.730	0.830
Systems Engineering	WR	NUWC Newport, RI	0.000	2,763	11/98	0.025	11/99	0.604	CONT.	CONT.	CONT.
Licenses										0.000	
Tooling										0.000	
GFE										0.000	
Award Fees										0.000	
Subtotal Product Development			37,008	6,808		1,392		0.604	0.000	45,812	
Remarks:											
Award Fees: (FY - Amount Budgeted - % Awarded)											
FY92 - \$205,367 - 57% FY95 - \$63,010 - 49% FY98 - \$220,000 - 74%											
FY93 - \$184,830 - 66% FY96 - \$271,199 - 88% FY99 - \$234,566 - 77%											
FY94 - \$154,025 - 78% FY97 - \$258,198 - 83% FY00 - \$124,039 - TBD											
Development Support Equipment										0.000	
Software Development										0.000	
Training Development										0.000	
Integrated Logistics Support										0.000	
Configuration Management										0.000	
Technical Data										0.000	
GFE										0.000	
Miscellaneous	WR		0.000	0.196	Various	0.239		0.000	CONT.	CONT.	CONT.
Subtotal Support			0.000	0.196		0.239		0.000	0.000	0.435	
Remarks:											

R-1 SHOPPING LIST - Item No. 159 - 4 of 159 - 5

Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 4 of 5)

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CLASSIFICATION:

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Exhibit R-3 Cost Analysis (page 2)		DATE:		February 2000						
APPROPRIATION/BUDGET ACTIVITY		PROJECT NAME AND NUMBER								
RDT&E, N/BA-7		Submarine Defensive Warfare Systems/V1265								
PROGRAM ELEMENT		Sub Acoustic Warfare Dev/0101226N								
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Award Date	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	OPTEVFOR Norfolk, VA	0.055	0.000				0.000	0.055	0.055
Operational Test & Evaluation	WR	OPTEVFOR Norfolk, VA				03/00			1.047	1.047
GFE									0.000	0.000
Subtotal T&E			0.055	0.000				0.000	1.102	1.175
Remarks:										
Contractor Engineering Support									0.000	0.000
Government Engineering Support									0.000	0.000
Program Management Support	C/CPFF	RM Vredenburg Reston, VA	0.750	0.767	12/98	11/99	12/00	CONT.	CONT.	CONT.
Travel		PMS415	0.110	0.100				CONT.	CONT.	CONT.
Labor (Research Personnel)									0.000	0.000
Overhead									0.000	0.000
Subtotal Management			0.860	0.867				0.000	2.502	2.502
Remarks:										
Total Cost			37.923	7.871				3.178	0.879	CONT.
Remarks:										

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**EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0204136N**

**PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS**

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
E1662 F/A-18 Improvements	94,591	175,130	124,842	89,444	22,034	31,125	19,321	0	3,272,728
E2065 F/A-18 RADAR Upgrade	2,489	3,920	104,098	106,936	86,276	50,948	29,908	3,900	661,602*
E2130 F/A-18 Follow-On Variant	197,655	141,834	19,153	1,290	0	0	0	0	5,574,010
<b>TOTAL</b>	<b>294,735</b>	<b>320,884</b>	<b>248,093</b>	<b>197,670</b>	<b>108,310</b>	<b>82,073</b>	<b>49,229</b>	<b>3,900</b>	<b>9,523,009</b>

\*This includes RUG Phase I and II

Quantity of RDT&E Articles

10

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The F/A-18 is capable of using external equipment to perform either fighter or attack missions. The capabilities of the F/A-18 weapon system can be upgraded to accommodate and incorporate new or enhanced weapons as well as advances in technology to respond effectively to emerging future threats. Continued development capability is required to successfully optimize new F/A-18 weapon system capabilities in the Fleet. Additionally, continued improvements in reliability and maintainability are necessary to ensure maximum benefit is achieved through reduced cost of ownership and to provide enhanced availability.

F/A-18 Improvements: The F/A-18 Naval Strike Fighter program transitioned from full-scale engineering development to operational systems development during FY 1983. As F/A-18 squadrons report discrepancies and new requirements, a continuing capability is needed to perform technical evaluations, investigative flight testing, software support, and incorporate Pre-Planned Product Improvements (P<sup>3</sup>) (i.e., capability enhancements).

**R-1 Item No. 160**  
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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 1 of 25)

**UNCLASSIFIED**  
**EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0204136N**

**PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS**

F/A-18 Radar Upgrade: The F/A-18 Radar Upgrade, Active Electronically Scanned Array (AESA) development program, beginning in FY 1999, is the last of three pre-planned upgrades to the F/A-18 Type/Model/Series radar. The AESA corrects operational test deficiencies noted in the AN/APG-73. It provides for multi-target tracking, Synthetic Aperture Radar (SAR) imagery, SAR Target Location Error (TLE), and improved spotlight map resolution. In addition, it provides for greater lethality than previous F/A-18 radars by allowing for full tactical support of existing and planned air-to-air (A/A) and air-to-ground (A/G) weapons which significantly increases A/A and A/G detection and tracking ranges. The AESA provides greater survivability through self-protection and standoff jamming capabilities, while its greater range allows for reduced detection by enemy radar. The AESA is also more affordable than previous radars. Significant savings in operating and support costs can be realized through a five fold increase in reliability over the AN/APG-73 as well as incorporating open architecture and Higher Order Language software. Additionally, savings can be realized by avoiding parts obsolescence redesign costs that will be experienced on the AN/APG-65 and AN/APG-73.

F/A-18 Follow-On Variant: The follow-on F/A-18 (E/F version) is an airframe upgrade incorporating increased capabilities, performance, and survivability necessary to satisfy the 41% percent increase in range over the C/D in the high-low-low-high attack/interdiction mission carrying three 480 gallon drop tanks, four 1,000 pound bombs, and two AIM-9 air-to-air missiles. The E/F version has increased internal fuel capacity, increased weapons carriage capability, increased carrier recovery payload, enhanced survivability/vulnerability, increased growth capacity, and increased engine thrust. It retains all of the P<sup>3</sup> enhancements developed for the earlier night attack C/D version of the aircraft.

**(U) JUSTIFICATION FOR BUDGET ACTIVITY:** This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing operational systems.

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**Exhibit R-2 RDT&E Budget Item Justification**  
**(Exhibit R-2, Page 2 of 25)**

# UNCLASSIFIED

## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204136N      PROJECT NUMBER: E1662  
 PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS      PROJECT TITLE: F/A-18 IMPROVEMENTS

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
E1662 F/A-18 Improvements	94,591	175,130	124,842	89,444	22,034	31,125	19,321	0	3,272,728

Quantity of RDT&E Articles: Not Applicable

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The F/A-18 is a multi-mission strike fighter aircraft that is used in both fighter and attack roles through selected use of external equipment (fuel tanks, targeting/navigation, Forward Looking Infrared (FLIR) pods, and various bomb/missile launching racks). In order to respond effectively to emerging future threats, F/A-18 aircraft capabilities are being upgraded to incorporate new/enhanced weapons systems and avionics including the Positive Identification System (PIDS) (incorporates Congressionally mandated Combined Interrogator Transponder (CIT) Identification Friend or Foe (IFF) System, Digital Communications System (DCS), Joint Helmet Mounted Cueing System (JHMCS), Advanced Targeting Forward Looking Infrared (ATFLIR), conversion of the System Configuration Set (SCS) to a Higher Order Language (HOL), development of the F/A-18 E/F Advanced Crew Station (ACS), initiation of development efforts for Expand 4/5 providing high resolution maps to be displayed in the cockpit, and upgrade of the existing Global Positioning System/Inertial Navigation System in order to meet precision strike/precision approach requirements. Continued hardware/software development is required to successfully optimize fleet F/A-18 weapons systems. As F/A-18 Squadrons report system problems/requirements, a continuing capability is needed to perform technical evaluations/investigative flight testing, provide software support and integrate selected improvements.

R-1 Item No. 160  
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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE:** February 2000

**BUDGET ACTIVITY:** 7

**PROGRAM ELEMENT:** 0204136N

**PROGRAM ELEMENT TITLE:** F/A-18 SQUADRONS

**PROJECT NUMBER:** E1662

**PROJECT TITLE:** F/A-18 IMPROVEMENTS

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

**1. FY 1999 ACCOMPLISHMENTS:**

- (U) (\$2,898) Continued to conduct engineering analysis and developed improvements to existing systems and subsystems for deficiencies identified during development of the aircraft. Provided technical support for the integration of new weapons and systems.
- (U) (\$2,159) Continued to develop and integrate enhancements to the effectiveness, operability, and safety of the F/A-18 Weapon System (airframe, avionics, and weapons) and subsystems to include Multifunctional Information Distribution System (MIDS), AIM-9X, and Tactical Air Moving Capability (TAMMAC). Continued to investigate deficiencies and develop corrective action.
- (U) (\$39,614) Continued development of DCS, PIDS, and JHMCS. Completed Phase I of BOL CHAFF wing tip certification on F/A-18C/D.
- (U) (\$49,920) Continued ATFLIR development, received Shape/Mass Model adapter, and started DT-IIA testing. Commenced conversion of the SCS to a HOL.

**2. FY 2000 PLAN:**

- (U) (\$1,478) Continue to conduct engineering analysis and develop improvements to existing systems and subsystems for deficiencies identified during development of the aircraft. Provide technical support for the integration of new weapons and systems.
- (U) (\$5,500) Continue to develop and integrate enhancements to the effectiveness, operability, and safety of the F/A-18 Weapon System (airframe, avionics, and weapons) and subsystems to include MIDS, AIM-9X, and TAMMAC. Continue to investigate deficiencies and develop corrective action.
- (U) (\$16,108) Continue development of DCS, PIDS, and JHMCS.

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**Exhibit R-2a, RDT&E Budget Project Justification**  
**(Exhibit R-2a, Page 4 of 25)**

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE:** February 2000

**BUDGET ACTIVITY:** 7

**PROGRAM ELEMENT:** 0204136N

**PROGRAM ELEMENT TITLE:** F/A-18 SQUADRONS

**PROJECT NUMBER:** E1662

**PROJECT TITLE:** F/A-18 IMPROVEMENTS

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

- (U) (\$93,770) Continue ATFLIR development, DT-IIA testing and start DT-IIIB testing. Initiate development studies for a Precision Navigation System.
- (U) (\$51,313) Continue conversion of the SCS to a HOL. Commence development of ACS to enable Independent Weapon System Operator functionalities.
- (U) (\$6,961) Initiate development studies and software improvements for Radar ECCM and ID techniques. Continue with BOL CHAFF flight testing and integration.

**3. FY 2001 PLAN:**

- (U) (\$1,207) Continue to conduct engineering analysis and develop improvements to existing systems and subsystems for deficiencies identified during development of the aircraft. Provide technical support for the integration of new weapons and systems.
- (U) (\$8,453) Continue to develop and integrate enhancements to the effectiveness, operability, and safety of the F/A-18 Weapon System (airframe, avionics, and weapons) and subsystems to include MIDS, AIM-9X, and TAMMAC. Continue to investigate deficiencies and develop corrective action.
- (U) (\$3,293) Complete development of DCS and PIDS. Continue development of JHMCS.
- (U) (\$37,419) Continue ATFLIR development, start DT-IIIC testing. Continue development efforts for Precision Navigation System.
- (U) (\$74,470) Continue development of an Advanced Crew Station and conversion of the SCS to a HOL.

**R-1 Item No. 160**  
**UNCLASSIFIED**

**Exhibit R-2a, RDT&E Budget Project Justification**  
**(Exhibit R-2a, Page 5 of 25)**

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7  
 PROGRAM ELEMENT: 0204136N  
 PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

PROJECT NUMBER: E1662  
 PROJECT TITLE: F/A-18 IMPROVEMENTS

### (U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	95,583	169,129	118,174
(U) Appropriated Value:	97,198	176,129	
(U) Adjustments from President's Budget:	-992	+6,001	+6,668
(U) FY 2001 President's Budget Submit:	94,591	175,130	124,842

### CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 net decrease of \$992 thousand consists of increases for joint helmet mounted cueing system (JHMCS) and HOL, offset by decreases for SBIR, MRTFB, minor reprogrammings, and inflation adjustments.

The FY 2000 net increase of \$6,001 consists of increases for BOL CHAFF and Radar ECCM Improvements offset by a decrease for an Across-the-Board Congressional rescission.

The FY 2001 net increase of \$6,668 thousand reflects increases for MIDS Integration, ATFLIR development and HOL offset by decreases for minor pricing and inflation adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7  
 PROGRAM ELEMENT: 0204136N  
 PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS  
 PROJECT NUMBER: E1662  
 PROJECT TITLE: F/A-18 IMPROVEMENTS

### (U) C. OTHER PROGRAM FUNDING SUMMARY

Appn:	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN-1 (E/F)	2,816,393	2,837,795	2,919,621	2,928,703	3,118,941	3,192,253	3,250,587	14,963,715
APN-5	171,421	319,650	212,614	197,869	231,353	249,353	256,532	Cont.

### Related RDT&E

- (U) P.E. 0207163N Advanced Medium Range Air-to-Air Missile (AMRAAM)
- (U) P.E. 0604727N Joint Stand-off Weapon (JSOW) System
- (U) P.E. 0604270N EW Development
- (U) P.E. 0604777N Navigation ID System, project X0921, NAVSTAR GPS equipment
- (U) P.E. 0404215N Standards Development
- (U) P.E. 0204136N Radar Upgrade (AESA)

- (U) D. ACQUISITION STRATEGY: The F/A-18 Improvements program consists of extensive development projects and integration of avionics systems onto the F/A-18E/F that were initially developed for incorporation onto the F/A-18C/D as the lead platform.  
 The major programs within the F/A-18 Improvements Line are as follows:
  - PIDS. PIDS is a sole source cost plus fixed fee contract on an R&D Basic Ordering Agreement. Will be bought as CFE through the prime contractor.
  - ATFLIR. The ATFLIR development was a sole source incentive fee contract to Boeing. Boeing competed the development contract.  
 The procurement supplier is planned to be sole source to Boeing.
  - Higher Order Language (HOL). The conversion of the System Configuration Set software to HOL will be accomplished by the F/A-18 Advanced Weapons Laboratory at China Lake as the designated Software Support Activity for the F/A-18. The design of the software will be accomplished by Boeing under sole source contracts. For CY 1999, work will be performed under an 845 agreement contract. Beginning in January 2000, the contract vehicle will shift to a Technical Direction Letter contract at China Lake. As the Prime contractor for the aircraft, Boeing is the design agent for software of aircraft in production.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0204136N**

**PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS**

**PROJECT NUMBER: E1662**

**PROJECT TITLE: F/A-18 IMPROVEMENTS**

**(U) D. ACQUISITION STRATEGY (con't)**

- Advanced Crew Station. The design and development of the Advanced Crew Station modification will be sole source to Boeing as the Prime aircraft contractor.
- DCS. DCS is a sole source cost plus fixed fee contract on an R&D Basic Ordering Agreement. Equipment is GFE.
- JHMCS. JHMCS is a sole source award fee Joint Air Force contract to Boeing.

**(U) E. SCHEDULE PROFILE: (not applicable)**

**R-1 Item No. 160**  
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**Exhibit R-2a, RDT&E Budget Project Justification**  
**(Exhibit R-2a, Page 8 of 25)**

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS  
PROGRAM ELEMENT: 0204136N

BUDGET ACTIVITY: 7

DATE: February 2000  
PROJECT NUMBER: E1662  
PROJECT TITLE: F/A-18 IMPROVEMENTS

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
PIDS/DCS Development/Integration	SS/CPFF/FFP	MDA St. Louis, MO	79,938	18,082	11/98	10,044	11/99	523	11/00	0	108,587	108,587
DCS E&MD	SS/FFP	Rockwell-Collins Cedar Rapids, IOWA	16,196								16,196	16,196
ATFLIR E&MD (Basic Contract) Note 1	CPIF/AF	MDA St. Louis, MO	10,079	31,900	11/98						41,979	41,979
ATFLIR AWARD FEE (non-add)			(803)	(2,445)							(3,248)	(3,248)
ATFLIR EMD (Option Contract)	CPIF/AF	MDA St. Louis, MO	0			60,000	10/99	13,745	10/00	5,084	78,829	78,829
ATFLIR AWARD FEE (non-add)						(1,178)		(1,257)		(1,493)	(3,928)	(3,928)
ATFLIR Support Equipment	WX	NAWCAD Lakehurst, NJ	12	111	11/98	9,338	11/99	5,194	11/00	0	14,655	
Advanced Crew Station	CPIF	MDA St. Louis	0			4,081	11/99	17,320	11/00	34,778	56,179	56,179
HOL Conversion	TDL	China Lake, CA	0			34,600	11/99	37,000	11/00	18,100	89,700	89,700
HOL Conversion	CPIF	MDA St. Louis	0	8,500	06/99	4,737	11/99	2,229	11/00	6,941	22,407	22,407
JHMS E&MD	MIPR	WPAFB Dayton, OH	5,000	4,718	11/98	788	11/99	792	11/00	0	11,298	11,298
Miscellaneous Development	Various	Various	5,284	691	10/99						5,975	
Software Development Engineering	WX	NAWCWD China Lake, CA	38,766	16,441	10/98	31,739	10/99	30,758	10/00	71,771	189,475	
Misc. Product Development	WX	Other Field Activities	2,615	504	10/98	734	10/99	4,075	10/00	0	7,928	
<b>Subtotal Product Development</b>			<b>157,890</b>	<b>80,947</b>		<b>156,061</b>		<b>111,636</b>		<b>136,674</b>	<b>643,208</b>	
<b>Note 1: Award Fees included in total contract value (Award Fees are non-add). FY99 and prior year award fee earned is 74.7% (ATFLIR)</b>												

LRIP 2

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## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

BUDGET ACTIVITY: 7		PROGRAM ELEMENT: 0204136N		PROJECT NUMBER: E1662		DATE: February 2000		PROJECT TITLE: F/A-18 IMPROVEMENTS	
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Award Date	Target Value of Contract
Subtotal Support	Not Applicable								0
Product T&E	WX	OPTEVFOR Norfolk, VA		147	11/99			11/00	9,878
	WX	NAWCAD Patuxent River, MD	40,493	10,925	10/98	16,634	10/99	11/00	89,385
Subtotal Test & Evaluation			40,493	11,072		16,634			99,263
Contractor Support/Travel/Misc	Various	NAVAIR Patuxent River, MD	6,554	2,572	11/98	2,435	11/99	11/00	18,953
Subtotal Management Services FY92 & Prior			6,554	2,572		2,435			18,953
			2,511,304						2,511,304
Total Cost			2,716,241	94,591		175,130			3,272,728

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204136N      PROJECT NUMBER: E2065  
 PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS      PROJECT TITLE: RADAR UPGRADE

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
E2065 F/A-18 Radar Upgrade	2,489	3,920	104,098	106,936	86,276	50,948	29,908	3,900	661,602*

\*Adding RUG Phase I and RUG Phase II

Quantity of RDT&E Articles: Not Applicable

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Active Electronically Scanned Array (AESA) development program, beginning in FY 1999, is the last of three pre-planned upgrades to the F/A-18 Type/Model/Series radar. The AESA corrects operational test deficiencies noted in the AN/APG-73. It provides for multi-target tracking, SAR imagery, SAR TLE, and improved spotlight map resolution. In addition, it provides for greater lethality than previous F/A-18 radars by allowing for full tactical support of existing and planned air-to-air (A/A) and air-to-ground (A/G) weapons which significantly increases A/A and A/G detection and tracking ranges. The AESA provides greater survivability through self-protection and standoff jamming capabilities, while its greater range allows for reduced detection by enemy radar. The AESA is also more affordable than previous radars. Significant savings in operation and support costs can be realized through a five fold increase in reliability over the AN/APG-73 as well as incorporating open architecture and Higher Order Language software. Additionally, savings can be realized by avoiding parts obsolescence redesign costs that will be experienced on the AN/APG-65 and AN/APG-73.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE:** February 2000

**BUDGET ACTIVITY:** 7

**PROGRAM ELEMENT:** 0204136N

**PROGRAM ELEMENT TITLE:** F/A-18 SQUADRONS

**PROJECT NUMBER:** E2065

**PROJECT TITLE:** RADAR UPGRADE

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

**1. FY 1999 ACCOMPLISHMENTS:**

- (U) (\$2,489) Conducted Pre-EMD AESA radar development activities.

**2. FY 2000 PLAN:**

- (U) (\$2,300) Continue Pre-EMD AESA radar development activities. Conduct Preliminary Design Review (PDR).
- (U) (\$666) Commence software development and systems integration efforts.
- (U) (\$786) Commence radar development/planning and prepare Milestone II documentation.
- (U) (\$168) Start test and evaluation planning phase. Start Integrated Logistics Support Efforts.

**3. FY 2001 PLAN:**

- (U) (\$99,098) Commence EMD. Conduct radar and aircraft installation Critical Design Reviews, Integrated Forebody testing, and radar cross-section assessments. Conduct Integrated Baseline Review.
- (U) (\$3,100) Continue radar development/planning and commence bench testing of aperture and radar processor. Continue Integrated Logistics efforts.
- (U) (\$1,250) Continue software development and systems integration efforts.
- (U) (\$650) Continue test planning for Developmental Test, Validation/Verification, and Operational Test.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204136N      PROJECT NUMBER: E2065  
PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS      PROJECT TITLE: RADAR UPGRADE

**(U) B. PROGRAM CHANGE SUMMARY**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	0	3,943	91,526
(U) Appropriated Value:	0	3,943	
(U) Adjustments from President's Budget:	+2,489	-23	+12,572
(U) FY 2001 President's Budget Submit:	2,489	3,920	104,098

**CHANGE SUMMARY EXPLANATION:**

(U) Funding: The FY 1999 net increase of \$2,489 thousand consists of an increase for AESA Pre-EMD development activities. FY 2000 reflects a decrease for an Across-the-Board Congressional Recision. The FY 2001 net increase of \$12,572 thousand reflects an increase for AESA development, offset by decreases for minor pricing and inflation adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7  
PROGRAM ELEMENT: 0204136N  
PROJECT NUMBER: E2065  
PROJECT TITLE: RADAR UPGRADE

PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS

### (U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN-5 (1)	18,827	56,941	18,543	3,713	4,232	17,979	16,595	12,723
APN-1E/F (2)	4,305	0	0	47,700	121,400	121,000	179,500	469,600

- (1) RUG Phase I & Phase II (retrofit)
- (2) RUG Phase I and AESA (production incorporated)

### Related RDT&E

- (U) P.E. 0204136N F/A-18 Squadrons (Project E1662: F/A-18 Improvements -- Higher Order Language, Aft Crew Station Upgrade)
- (U) P.E. 0603261N Tactical Airborne Reconnaissance

(U) D. ACQUISITION STRATEGY: The AESA program employs a two-phase approach with sole source contracts to Boeing, the airframe prime manufacturer. Phase I is a moderate risk reduction phase conducted in FY 1999 and FY 2000. During this phase, Boeing conducted competitive source selection at the radar system subcontract level. A BOA order for RFP development and subcontractor selection was made to conduct this effort. It includes an "845" agreement for prototype development, which includes commercial development/amortization provisions. Conducting the competition early in the program allowed for focused risk reduction and contractor investment.

Phase II will consist of a typical EMD program and development contract. The program transitions to Phase II with a successful Milestone II Decision in FY 2001. Once the program enters production, the "845" agreement allows the contractor to amortize unreimbursed development costs into the production unit cost. This strategy fully utilizes acquisition reform initiatives such as: early partnering with industry; alpha contracting; leveraging industry investment; optimizing use of Commercial Off-the Shelf software and Non-Developmental Item; Cost as an Independent Variable; and Electronic Data Deliverables.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**  
**PROGRAM ELEMENT: 0204136N**  
**PROJECT NUMBER: E2065**  
**PROJECT TITLE: RADAR UPGRADE**

**PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS**

**(U) E. SCHEDULE PROFILE:**

FY 1999                      FY 2000                      FY 2001                      TO COMPLETE

**(U) Program Milestones**

3Q/00- PRE-MSII                      1Q/01- MSII                      3Q/06 - MSIII

**(U) Engineering Milestones**

3Q/00-PDR                      2Q/01-CDR

**(U) T&E Milestones**

2Q- 4Q/05  
OPEVAL

**(U) Contract Milestones**

4Q/99-PRE EMD                      2Q/01 – EMD  
Contract Award

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## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER:  
PROJECT TITLE:

E2065  
F/A-18 RADAR  
UPGRADE

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>Total Cost</u>	<u>Target Value of Contract</u>
				<u>Cost</u>	<u>Award Date</u>	<u>Cost</u>	<u>Award Date</u>	<u>Cost</u>	<u>Award Date</u>		
AESA Radar Contract	SS/TBD	BOEING St. Louis, MO		2,000	09/99	2,300	12/99	98,898	01/01	201,659	304,857
AESA Radar Software Development/Integration	WX	NAWCWD China Lake, CA		389	12/99	670	01/00	3,500	10/00	40,278	44,837
AESA Radar Development	WX	NAWCAD Patuxent River, MD		100	12/99	650	01/00	1,250	10/00	1,608	3,608
RUG PHASE I	SS/LTR(FPIF)	MDA St. Louis, MO	171,000							171,000	171,000
RUG PHASE II	CPIF	MDA St. Louis, MO	51,729							51,729	51,729
RUG PHASE II Integration	CPFF	MDA St. Louis, MO	11,000							11,000	11,000
<b>Subtotal Product Development</b>			<b>233,729</b>	<b>2,489</b>		<b>3,620</b>		<b>103,648</b>		<b>243,545</b>	<b>587,031</b>
AESA Test & Evaluation	WX	NAWCAD Patuxent River, MD						7,380		7,380	
AESA Radar OPEVAL	WX	OPTEVFOR Norfolk, VA						4,742		4,742	

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2065

PROJECT TITLE: F/A-18 RADAR  
UPGRADE

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
				<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>			
RUG Upgrade Test & Evaluation	WX	NAWCWD China Lake, CA	49,390								49,390	
RUG UPGRADE OPEVAL	WX	COMOPTEVFOR	1,799								1,799	
RUG Upgrade Test & Evaluation	Various	Other Field Activities	4,815								4,815	
<b>Subtotal Test &amp; Evaluation</b>			<b>56,004</b>							<b>12,122</b>	<b>68,126</b>	
AESA Contractor Support /Travel/Misc	Various	NAVAIR Patuxent River, MD				300	12/99	450	10/00	3,792	4,542	
RUG Contractor Support/Travel/Misc	Various	NAVAIR Patuxent River, MD	1,963								1,963	
<b>Subtotal Management Services</b>			<b>1,963</b>			<b>300</b>		<b>450</b>		<b>3,792</b>	<b>6,505</b>	
<b>Total Cost</b>			<b>291,696</b>	<b>2,489</b>		<b>3,920</b>		<b>104,098</b>		<b>259,459</b>	<b>661,662</b>	

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204136N      PROJECT NUMBER: E2130  
 PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS      PROJECT TITLE: FOLLOW-ON VARIANT

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
E2130 Follow-On Variant	197,655	141,834	19,153	1,290	0	0	0	0	5,574,010

Quantity of RDT&E Articles

10

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The F/A-18 is a twin-engine, mid-wing, multi-mission, tactical aircraft employed in Navy and Marine Corps strike fighter squadrons. The F/A-18, through selected use of external equipment is designed for flexibility in fighter, attack, fleet air defense, and close air support roles. The F/A-18E/F variant is an upgrade to the night attack "C" and "D" models. The F/A-18E/F will be the second major upgrade since the program's inception. The F/A-18 continues to adapt its strike fighter role to evolving threats into the next century. The F/A-18E/F E&MD program is under a Congressional mandated cost cap of \$4.883B FY90 dollars. Pre-development efforts of \$36.6M (in FY90 base year dollars), previously funded under the F/A-18C/D program, is reflected in the RDT&E total, but is not included in the approved \$4.883B development cap.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE:** February 2000

**BUDGET ACTIVITY:** 7

**PROGRAM ELEMENT:** 0204136N

**PROJECT NUMBER:** E2130

**PROGRAM ELEMENT TITLE:** F/A-18 SQUADRONS

**PROJECT TITLE:** FOLLOW-ON VARIANT

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

**1. FY 1999 ACCOMPLISHMENTS:**

- (U) (\$131,928) Continued engineering and manufacturing design activity in support of development flight test.
- (U) (\$4,614) Continued to develop and integrate mission software.
- (U) (\$55,113) Continued developmental flight testing, begin and complete DT-IID (TECHEVAL), and start DT-IIIE and OT-IIC (OPEVAL).
- (U) (\$6,000) Continued Test Program Set (TPS) development.

**2. FY 2000 PLAN:**

- (U) (\$98,251) Complete engineering and manufacturing design activity in support of developmental flight test and prepare for Milestone-III (MS-III) Defense Acquisition Board (DAB).
- (U) (\$5,226) Continue to develop and integrate mission software.
- (U) (\$29,357) Complete DT-IIIE and OT-IIC (OPEVAL).
- (U) (\$9,000) Continue Test Program Set (TPS) development.

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**Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 19 of 25)**

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0204136N**

**PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS**

**PROJECT NUMBER: E2130**

**PROJECT TITLE: FOLLOW-ON VARIANT**

**3. FY 2001 PLAN:**

- (U) (\$4,411) Continue to develop and integrate mission software.
- (U) (\$8,542) Complete integration and testing of avionics subsystems.
- (U) (\$6,200) Continue Test Program (TPS) development.

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**Exhibit R-2a, RDT&E Project Justification**  
**(Exhibit R-2a, Page 20 of 25)**

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0204136N**      **PROJECT NUMBER: E2130**  
**PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS**      **PROJECT TITLE: FOLLOW-ON VARIANT**

**(U) B. PROGRAM CHANGE SUMMARY**

(U) FY 2000 President's Budget:	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Appropriated Value:	206,450	142,642	28,550
(U) Adjustments from President's Budget:	216,607	142,642	
(U) FY 2001 President's Budget Submit	-8,795	-808	-9,397
	197,655	141,834	19,153

**CHANGE SUMMARY EXPLANATION:**

- (U) Funding: The FY1999 decrease consists of SBIR and MRTFB assessments as well as minor pricing and inflation adjustments.
- (U) The FY00 decrease reflects a \$808 thousand reduction for an Across the Board Congressional Rescission.
- (U) The FY 2001 net decrease of \$9,397 thousand consists of reductions for HOL development and minor pricing and inflation adjustments.

- (U) Schedule: Not Applicable
- (U) Technical: Not Applicable.

**R-1 Item No. 160**  
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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204136N      PROJECT NUMBER: E2130  
 PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS      PROJECT TITLE: FOLLOW-ON VARIANT

### (U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
(U) A/C QTY	30	36	42	45	48	48	48	219
(U) APN-1	2,816,393	2,837,795	2,919,621	2,928,703	3,118,941	3,192,253	3,250,587	14,963,715
(U) APN-6	83,504	80,173	141,757	116,654	53,766	56,645	78,668	241,957

### Related RDT&E

- (U) PE 0207163N (AMRAAM)
- (U) PE 0604727N (Joint Standoff Weapon System) (JSOW)
- (U) PE 0604270N (EW Development)
- (U) PE 0604777N (Navigation/ID System)
- (U) PE 0305141D (Joint UAV)
- (U) PE 0603261N (Tactical Airborne Reconnaissance)
- (U) PE 0204163N (Fleet Communications)
- (U) PE 0604215N (Standards Development)

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204136N      PROJECT NUMBER: E2130  
 PROGRAM ELEMENT TITLE: F/A-18 SQUADRONS      PROJECT TITLE: FOLLOW-ON VARIANT

(U) D. ACQUISITION STRATEGY: The July 1992 award of the two RDT&E,N contracts to MDA (airframe) and General Electric (engine), both sole source cost plus incentive fee/award fee, effectively initiated the F/A-18E/F E&MD program. The airframe and engine contracts are incrementally funded through FY00 and FY99, respectively. In March 1997, the F/A-18E/F program received approval to enter the Low Rate Initial Production (LRIP) phase. The airframe and engine contracts for this phase are Cost Plus Incentive Fee (CPIF) for LRIP I and Fixed Price Incentive Fee (FPIF) for LRIP II and LRIP III. LRIP III is a priced option to the LRIP II contract. The LRIP II/III contract possesses a common incentive profit structure which affords contractors maximum opportunity to implement quality, reliability, and producibility improvements. Benefits of the F/A-18E/F LRIP contracts include: 1) a measurable profit incentive across the LRIP period of performance; 2) commercial-like long time relationship with contractors which tie customer (fleet) satisfaction to long term profitability; 3) progressive assumption of risk by the contractors; 4) a single negotiation for LRIP II and III.

### (U) E. SCHEDULE PROFILE

FY 2001

FY 2000

FY 1999

(U) Program Milestones

2Q/99-NPR

2Q/MS-III  
4Q/IOC

(U) Engineering Milestones

1Q/99-ENG FPQ

(U) T&E Milestones

1Q/99-2Q/99-DT-IIID  
(TECHEVAL)  
3Q/99 -1Q/00 OT-IIIC  
(OPEVAL)

(U) Contract Milestones

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204136N

PROJECT NUMBER: E2130  
PROJECT TITLE: FOLLOW-ON  
VARIANT

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001 Cost	FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
				FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date					
Support												
Subtotal Support (Not Applicable)												
Operational Test	WX	OPTEVFOR Norfolk, VA	1,568	11,889	11/98	1,000	10/99	4,000	10/00	0	18,457	
Flying Qualities and Performance	MIPR	NASA Langley, AFB	7,156	0		820				0	7,976	
Integrated Test Team	WX	NAWCAD Patuxent River, MD	220,268	23,182	11/98	12,648	10/99	725	10/00	0	256,823	
Wind Tunnel Test	MIPR	Arnold Eng Development Center(AEDC) Tullahoma, TN	33,765	4,176	11/98	6,000	10/99			0	43,941	
Misc Test & Evaluation	Various	Other Field Activities	8,002	0		0				0	8,002	
Subtotal Test & Evaluation			270,759	39,247		20,468		4,725		0	335,199	
Contractor Support/Travel/Misc	Various	NAVAIR Patuxent River, MD	50,359	4,636	11/99	2,403	10/99	1,022	11/00	180	58,600	
Subtotal Management SBIR Assessment			50,359	4,636		2,403		1,022		180	58,600	
Total Cost			5,214,078	197,655		141,834		19,153		1,290	5,574,010	

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**EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0204152N**  
**PROGRAM ELEMENT TITLE: E-2 SQUADRONS**

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program continued
E0463 - (E-2C Improvements)	10,125	12,379	6,444	6,335	6,499	6,580	6,773	continued	continued
E2321 - (E-2 Radar Modernization)	35,051	23,951	12,254	13,586	5,820	0	0	0	112,189
<b>TOTAL</b>	45,176	36,330	18,698	19,921	12,319	6,580	6,773	continued	continued
<b>Quantity of RDT&amp;E Articles</b>	0	0	0	0	0	0	0	0	14

(U)A. **MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: E-2C Improvements** provides pre-planned product improvements for the evolution of E-2C airborne weapon system capabilities in support of naval warfare command and control requirements. It has previously funded developments for the modification/replacement of selected weapon replaceable assemblies of current installed subsystems. This has resulted in a new baseline capability configuration referred to as Group II aircraft. The program has developed a Mission Computer Upgrade (MCU), applying on-going developments in data processing and target detection, which will relieve current bottlenecks in signal and data processing. The MCU will permit incorporation of additional functional capabilities to satisfy evolving operational requirements, e.g., Cooperative Engagement Capability (CEC), Satellite Communications (SATCOM), and permits the evolutionary growth of a Cruise Missile Defense (CMD) capability.

FY00-05: Funding provides for technology insertion of new emergent systems and subsystems. This initiative allows for data collection and the evaluation of new technologies in the context of emerging missions and requirements including Cruise Missile Defense, Ballistic Missile Defense, littoral warfare, combat identification, and Single Integrated Air Picture as well as parts and systems obsolescence. Emphasis will be upon the following areas: participation in exercises to assess capabilities against emerging threats; identify deficiencies; identification of candidate solutions; and ground/airborne demonstrations of the identified technologies.

**The Radar Modernization Program (RMP)** is a ground and flight prototype test demonstration and risk mitigation of multiple technologies. It initiates the application of new radar technologies to modernize the primary sensor of the E-2C weapon system to provide a definitive littoral surveillance capability integral to the Navy's Theater Air Missile Defense (TAMD) Integrated Warfare Architecture. Key technologies to be integrated are space-time adaptive processing (STAP), electronically scanning array (ESA), solid state transmitter, and high dynamic range digital receivers. The resulting detection system will provide a substantially improved overland performance, enhancing all current required mission areas while simultaneously contributing to the emerging TAMD mission requirements. The impact of the dominant battlefield awareness provided by this improved airborne early warning system will substantially contribute to the development of a single integrated air picture. These technologies and resultant equipment demonstrated in ground environment in FY1999, will be flight tested in FY2001 through FY2003 leading to an engineering change proposal (ECP) for introduction into fleet aircraft.

**(U) JUSTIFICATION FOR BUDGET ACTIVITY:** This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing operational systems.

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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 1 of 13)

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7  
(U) COST: (Dollars in Thousands)

PROGRAM ELEMENT: 0204152N  
PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT NUMBER: E0463  
PROJECT TITLE: E-2C Improvements

Project Number & Title	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
E0463 - (E-2C Improvements)	10,125	12,379	6,444	6,335	6,499	6,580	6,773	continued	continued
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	14

(U) A. **MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:** E-2C Improvements provides pre-planned product improvements for the evolution of E-2C airborne weapon system capabilities in support of naval warfare command and control requirements. It has previously funded developments for the modification/replacement of selected weapon replaceable assemblies of current installed subsystems. This has resulted in a new baseline capability configuration referred to as Group II aircraft. The program has developed a Mission Computer Upgrade (MCU), applying on-going developments in data processing and target detection, which will relieve current bottlenecks in signal and data processing. The MCU will permit incorporation of additional functional capabilities to satisfy evolving operational requirements, e.g., Cooperative Engagement Capability (CEC), Satellite Communications (SATCOM), and permits the evolutionary growth of a Cruise Missile Defense (CMD) capability.

FY00-05: Funding provides for technology insertion of new emergent systems and subsystems. This initiative allows for data collection and the evaluation of new technologies in the context of emerging missions and requirements including Cruise Missile Defense, Ballistic Missile Defense, littoral warfare, combat identification, and Single Integrated Air Picture as well as parts and systems obsolescence. Emphasis will be upon the following areas: participation in exercises to assess capabilities against emerging threats; identify deficiencies; identification of candidate solutions; and ground/airborne demonstrations of the identified technologies.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0204152N**  
**PROGRAM ELEMENT TITLE: E-2 SQUADRONS**

**PROJECT NUMBER: E0463**  
**PROJECT TITLE: E-2C IMPROVEMENTS**

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

**1. FY 1999 ACCOMPLISHMENTS:**

- (U) (\$3,551) - Conducted Spectrum Testing.
- (U) (\$6,574) – Continued software development and system integration.

**2. FY 2000 PLAN:**

- (U) (\$3,979) – Collect sensor data. Down select technologies for demonstration. Perform demonstration of selected systems.
- (U) (\$3,000) – Initiate Advanced Support Aircraft (ASA) Post Multi Year Procurement (MYP) Study.
- (U) (\$5,400) – Integrate UHF Electronically Scanned Antenna (UESA).

**3. FY 2001 PLAN:**

- (U) (\$6,444) – Collect sensor data. Down select technologies for demonstration. Perform ground and flight demonstration of selected systems.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0204152N**      **PROJECT NUMBER: E0463**  
**PROGRAM ELEMENT TITLE: E-2 SQUADRON**      **PROJECT TITLE: E-2C IMPROVEMENTS**

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	9,783	4,048	6,544
(U) Appropriated Value:	10,439	12,448	
(U) Adjustments from Pres Budget:	342	8,331	-100
(U) FY2001 President's Budget Submit:	10,125	12,379	6,444

**CHANGE SUMMARY EXPLANATION:**

(U) Funding –  
The FY1999 increase is due to minor pricing and inflation adjustments.

The FY2000 increase is due to increases for a follow-on Advanced Support Aircraft (ASA) study and UHF Electronically Scanable Antenna (UESA) development, and a decrease for an Across-the-Board Congressional Rescission.

The FY2001 decrease is due to minor pricing and inflation adjustments.

(U) Schedule – Not Applicable.

(U) Technical – Not Applicable.

**R-1 Item No. 161**  
**UNCLASSIFIED**

# UNCLASSIFIED

## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204152N      PROJECT NUMBER: E0463  
 PROGRAM ELEMENT TITLE: E-2C SQUADRONS      PROJECT TITLE: E-2C IMPROVEMENTS

### (U) C. OTHER PROGRAM FUNDING SUMMARY

	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN 1/E-2C (LI #9 & 10)	395,820	382,608	320,872	264,220	214,618	0	0	0
APN 5/E-2C (LI #33)	80,889	75,921	18,485	26,196	11,596	16,836	13,736	1,331,600
APN 6/E-2C (LI #46)	12,390	12,953	13,093	14,889	4,276	2,874	0	0

### Related RDT&E

(U) 0603658N (Ship Self Defense, CEC)

(U) C. ACQUISITION STRATEGY: Work will be led in-house. Necessary contractor support will be acquired using already existing contracts.

### (U) D. SCHEDULE PROFILE

FY1999      FY2000      FY2001      To Complete

(U) Program Milestones

3Q/01 MCU MSIII  
 Infra Red Search & Track (IRST) Demo  
 Laser Radar (LADAR) Demo  
 Multi Source/Multi Sensor Integration (MSI) Demo

(U) Engineering Milestones

(U) T&E Milestone

2Q/00 MCU DT/OT-IIC  
 3Q/00 MCU DT/IIDTECHEVAL  
 4Q/00 MCU OPEVAL

Ground Demo

(U) Contract Milestones

4Q/01 MCU FRP

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DATE: February 2000

## EXHIBIT R-3, FY 2001 RDT&amp;E,N COST ANALYSIS

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E0463  
PROJECT TITLE: E-2C IMPROVEMENTS

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		Cost to Complete	Total Cost	Target Value of Contract
				FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date			
PRODUCT DEVELOPMENT												
Hardware/Software Develop. – MCU	SS/CPFF	GAC, NY/FL	149,801	5,682	12/98	0		0		0	155,483	155,483
Hardware/Software Develop. - CEC/MCU	SS/CPFF	GAC, NY/FL	12,194	0		0		0		0	12,194	12,194
Hardware/Software Develop. – MCU	SS/CPFF	GAC, NY/FL	13,998	0		0		0		0	13,998	13,998
Hardware/Software Develop. Misc.- MCU	SS/CPFF	GAC, NY/FL	1,021	0		0		0		0	1,021	1,021
Hardware/Software Dev.-Prior Yr. Efforts		GAC, NY/FL	254,800	0		0		0		0	254,800	254,800
Subtotal Product Development			431,814	5,682		0		0		0	437,496	437,496
SUPPORT												
Government Eng Support - MCU	WX/RC	NAWCAD PAX, MD	9,103	50	10/98	300	2/00	0		0	9,453	
Gov't Eng Support – Prior Yr. Efforts	WX/RC	NAWCAD PAX, MD	58,800	0		0		0		0	58,800	
Government Eng Support (AIR 4.2)-MCU	WX	NAWCAD PAX, MD	247	150	10/98	0		0		0	397	
Government Eng Support – ASA	WX/RX	NAWCAD PAX, MD	0	0		2,700	5/00	0		0	2,700	
Government Eng Support – UESA	WX	NAWCAD PAX, MD	0	0		4,000	5/00	0		0	4,000	
Subtotal Support			68,150	200		7,000		0		0	75,350	

GAC = GRUMMAN AEROSPACE CORPORATION

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DATE: February 2000

## EXHIBIT R-3, FY 2001 RDT&amp;E,N COST ANALYSIS

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E0463

PROJECT TITLE: E-2C IMPROVEMENTS

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		Cost to Complete	Total Cost	Target Value of Contract
				FY 1999 Cost	Award Date	FY 2000 Cost	Award Date	FY 2001 Cost	Award Date			
<u>TEST &amp; EVALUATION</u>												
Test & Evaluation – MCU	WX/RC	NAWCAD PAX	34,655	3,923	10/98	0		0		0	38,578	
Test & Evaluation – UESA	WX/RX	NAWCAD PAX	0	0		1,100	2/00	0		0	1,100	
Test & Evaluation - (Prior Yr. Effort)	WX	NAWCAD PAX	39,200	0		0		0		0	39,200	
ACIS (PMS-440)	PD	NAVSEA	2,235	0		0		0		0	2,235	
LEAR JET – MCU	PD	PMA-207	307	294	5/99	0		0		0	601	
Test & Evaluation – MCU	WX	PMRF, HAWAII	1,500	0		0		0		0	1,500	
Miscellaneous – MCU	MIPR	VARIOUS	666	0		0		0		0	666	
Test & Evaluation – IMPROV	WX	NAWCAD PAX	0	0		3,964	10/99	4,449	10/00	Continued	Continued	
Test & Eval. – CONTRACT /IMPROV	PD	TBD	0	0		300	5/00	1,979	10/00	0	2,279	
Subtotal Test & Evaluation			78,563	4,217		5,364		6,428		Continued	Continued	
<u>MANAGEMENT</u>												
Management	WX/RX	NAWCAD PAX, MD	91	0	10/98	0		0		0	91	
TRAVEL	WX	NAWCAD PAX, MD	74	26	10/98	15	10/99	16	10/00	80	211	
Subtotal Management			165	26		15		16		80	302	
GRAND TOTAL			578,692	10,125		12,379		6,444		Continued	Continued	

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DATE: February 2000

## EXHIBIT R-2a, FY 2001 RDT&amp;E,N BUDGET PROJECT JUSTIFICATION SHEET

## BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E2321

PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT TITLE: RADAR MODERNIZATION PROGRAM

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999</u> <u>Actual</u>	<u>FY 2000</u> <u>Estimate</u>	<u>FY 2001</u> <u>Estimate</u>	<u>FY 2002</u> <u>Estimate</u>	<u>FY 2003</u> <u>Estimate</u>	<u>FY 2004</u> <u>Estimate</u>	<u>FY 2005</u> <u>Estimate</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
E2321 E-2 RADAR MODERNIZATION PROGRAM	35,051	23,951	12,254	13,586	5,820	0	0	0	112,189

Quantity of RDT&amp;E Articles: Not applicable.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Radar Modernization Program (RMP) is a ground and flight prototype test demonstration and risk mitigation of multiple technologies. It initiates the application of new radar technologies to modernize the primary sensor of the E-2C weapon system to provide a definitive littoral surveillance capability integral to the Navy's Theater Air Missile Defense (TAMD) Integrated Warfare Architecture. Key technologies to be integrated are space-time adaptive processing (STAP), electronically scanning array (ESA), solid state transmitter, and high dynamic range digital receivers. The resulting detection system will provide a substantially improved overland performance, enhancing all current required mission areas while simultaneously contributing to the emerging TAMD mission requirements. The impact of the dominant battlefield awareness provided by this improved airborne early warning system will substantially contribute to the development of a single integrated air picture. These technologies and resultant equipment demonstrated in ground environment in FY1999, will be flight tested in FY2001 through FY2003 leading to an engineering change proposal (ECP) for introduction into fleet aircraft.

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DATE: February 2000

EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E2321

PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT TITLE: RADAR MODERNIZATION PROGRAM

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$3,112) – Completed risk reduction, testing and data analysis of form factor modules.
- (U) (\$4,406) - Completed integration and checkout (IACO) of flight instrumentation package.
- (U) (\$7,378) - Conducted ground testing at Pacific Missile Range Facility (PMRF).
- (U) (\$5,260) - Designed aircraft installation provisions for transition of flight hardware from ground tests to flight test vehicle.
- (U) (\$4,173) - Conducted final design review.
- (U) (\$10,722) - Initiated modification and fabrication of hardware for installation in flight vehicle C-130.

2. FY 2000 PLAN:

- (U) (\$4,906) - Complete modification and fabrication of hardware and installation provisions in C-130.
- (U) (\$7,045) - Start the IACO of full flight test system in C-130.
- (U) (\$12,000) - Accelerate RMP/MCU Upgrade Development.

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DATE: February 2000

EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E2321

PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT TITLE: RADAR MODERNIZATION PROGRAM

3. FY 2001 PLAN:

- (U) (\$3,063) - Complete the IACO of C-130 Test Bed.
- (U) (\$1,224) – Install Flight Test Instrumentation.
- (U) (\$1,836) – Conduct Subsystem Flight Test.
- (U) (\$612) – Perform Elemental Data Analysis/Generate Quicklook Report.
- (U) (\$3,078) – Complete Preliminary Design of C-130 Processing Suite.
- (U) (\$2,441) - Initiate Parts/Fabrication of C-130 Processing Suite.

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DATE: February 2000

## EXHIBIT R-2a, FY 2001 RDT&amp;E,N BUDGET PROJECT JUSTIFICATION SHEET

## BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E2321

PROJECT TITLE: RADAR MODERNIZATION PROGRAM

## (U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	36,839	12,084	6,397
(U) Appropriated Value:	37,358	24,084	
(U) Adjustments from Pres Budget:	-1,788	+11,867	+5,857
(U) FY 2001 President's Budget Submit:	35,051	23,951	12,254

## CHANGE SUMMARY EXPLANATION:

(U) Funding:

The FY1999 decrease is due to minor pricing and inflation adjustments.

The FY2000 increase is due to RMP/MCU Upgrade Development.

The FY2001 increase is due to an increase for RMP restructure and decreases for minor pricing and inflation adjustments.

(U) Schedule: Program plan adjustments for FY1999 and FY2000 reflect a restructured integrated schedule.

(U) Technical: Not applicable.

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DATE: February 2000

EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROGRAM ELEMENT TITLE: E-2 SQUADRONS

PROJECT NUMBER: E2321

PROJECT TITLE: RADAR MODERNIZATION PROGRAM

(U) C. OTHER PROGRAM FUNDING SUMMARY: Not applicable

(U) Related RDT&E

(U) PE 0603238N (Global Surveillance Precision Strike and Advanced Technology) will fund the R&D effort to integrate existing RMP technologies at the PMRF for inclusion in TAMID. There are no requirements from this program element in FY00, but there may be additional requirements in FY01.

(U) C. ACQUISITION STRATEGY: Not applicable. Non-acquisition ground and flight prototype test demonstration and risk mitigation of multiple technologies.

(U) D. SCHEDULE PROFILE: Not applicable. Non-acquisition ground and flight prototype test demonstration and risk mitigation of multiple technologies.

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## UNCLASSIFIED

DATE: February 2000

## EXHIBIT R-3, FY 2001 RDT&amp;E,N COST ANALYSIS

## BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204152N

PROJECT NUMBER: E2321

PROJECT TITLE: RADAR MODERNIZATION PROGRAM

Cost Categories:	Contract Method	Performing Activity & Location	Total Prior Yrs	FY 1999		FY 2000		FY 2001		FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
				Cost	Date	Cost	Date	Cost	Date				
<b>PRODUCT DEVELOPMENT</b>													
Hardware/Software Develop.	SS/CPFF	CLASSIFIED	19,462	26,937	10/98	8,595	10/99	1,404	10/00	10/00	12,478	68,876	68,876
Hardware/Software Develop.	SS/CPFF	GAC, NY	0	5,278	11/98	11,089	10/99	6,678	10/00	10/00	0	23,045	23,045
Hardware/Software Develop.	MIPR	HANSCOMB AFB, MA	748	0		0		0			0	748	748
Hardware/Software Develop.	SS/CPFF	KIRKLAND AFB, TX	476	0		0		0			0	476	476
<b>Subtotal Product Development</b>			<b>20,686</b>	<b>32,215</b>		<b>19,684</b>		<b>8,082</b>			<b>12,478</b>	<b>93,145</b>	
<b>SUPPORT</b>													
Government Engineering Support	WR/WX	NAWCAD PAX, MD	332	601	10/98	2,417	10/99	319	10/00	10/00	2,016	5,685	
Government Engineering Support	CPFF	CLASSIFIED	332	150	10/98	165	10/99	165	10/00	10/00	180	660	660
<b>Subtotal Support</b>				<b>751</b>		<b>2,582</b>		<b>484</b>			<b>2,196</b>	<b>6,345</b>	
<b>TEST &amp; EVALUATION</b>													
Test & Evaluation	WX/WR	NAWCAD PAX, MD	0	1,700	10/98	1,300	10/99	3,303	10/00	10/00	4,521	10,824	
Test & Evaluation	CPFF	CLASSIFIED	265	300	10/98	330	10/99	330	10/00	10/00	360	1,585	1,585
<b>Subtotal Test &amp; Evaluation</b>			<b>265</b>	<b>2,000</b>		<b>1,630</b>		<b>3,633</b>			<b>4,881</b>	<b>12,409</b>	
<b>MANAGEMENT</b>													
Management Travel	CPFF WX	CLASSIFIED NAWCAD PAX, MD	0	50	10/98	55	10/99	55	10/00	10/00	60	220	220
			35	35	10/98	0		0			0	70	
<b>Subtotal Management</b>			<b>35</b>	<b>85</b>		<b>55</b>		<b>55</b>			<b>60</b>	<b>290</b>	
<b>Total Cost</b>			<b>21,318</b>	<b>35,051</b>		<b>23,951</b>		<b>12,254</b>			<b>19,615</b>	<b>112,189</b>	

R-1 Item No. 161  
UNCLASSIFIEDExhibit R-3, Cost Analysis  
(Exhibit R-3, Page 13 of 13)

# UNCLASSIFIED

## FY 2001 RDT&E, N BUDGET ITEM JUSTIFICATION

Exhibit R-2, RDT&E, N BUDGET ITEM JUSTIFICATION

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N

PROGRAM ELEMENT TITLE: Fleet Communications

COST (\$ in Thousands)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
X0725 Communication Automation	1,730	2,618	3,347	2,896	1,962	2,013	2,066	CONT	CONT
X1083 Shore to Ship Communications System	12,433	8,065	8,105	6,839	7,045	7,652	7,419	CONT	CONT
X0795 Support of MEECN	695	688	560	524	698	741	759	CONT	CONT
Total P.E. Cost	14,858	11,371	12,012	10,259	9,705	10,406	10,244	CONT	CONT

### A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Communications Automation Program (NAVMACS II/SMS) develops joint/combined individual and organizational message handling to US Naval ships, USMC Vans, and selected MSC and USCG platforms. NAVMACS II/SMS develops fleet interface to DMS and legacy ashore messaging systems. The Shore to Ship Communications System develops communications systems elements which provide positive command and control of deployed ballistic missile submarines (SSBNs). Minimum Essential Emergency Communications Network (MEECN) is the Tri-Service transmission system which ensures delivery of Emergency Action Messages (EAM) to our strategic platforms. DWTS Low-Data Rate (EPLRS) Navy requires a digital wideband capability which can be used in amphibious operations where a fixed DWTS station cannot be used. System must be interoperable with Army and Marine Corps EPLRS system.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems

B. (U) PROGRAM CHANGE SUMMARY: FY99: Reflects Congressional reductions associated with Inflation Savings (- \$73K). Transfer for SBIR/STTR (-\$364K), LOCO-GPSI Reprogramming (- \$138K) and Miscellaneous Department Adjustments (- \$679K). FY00: Reflects Congressional Adjustment (- \$61K) and reprogramming for Low-Data Rate DWTS (EPLRS) (+ \$1,485K). \$223k portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638. FY01: Reflects an increase to Continued Evaluation Program (CEP) (+ \$400K), MEECN (- \$98K), IT-21/NWI reduction (- \$540K), Low-Data Rate DWTS (EPLRS) (+ \$ 2000K), and Miscellaneous Department Adjustments (- \$103K).

C. (U) OTHER PROGRAM FUNDING SUMMARY: See individual projects.

R-1 Shopping List - Item No 162-1 of 162-14

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Exhibit R-2, RDT&E, N Budget Item Justification



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**FY 2001 RDT&E, N BUDGET ITEM JUSTIFICATION**

Exhibit R-2, RDT&E, N BUDGET ITEM JUSTIFICATION

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N

PROGRAM ELEMENT TITLE: Fleet Communications

D. (U) ACQUISITION STRATEGY: See individual projects.

E. (U) SCHEDULE PROFILE: See individual projects.

R-1 Shopping List - Item No 162-2 of 162-14

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Exhibit R-2, RDT&E, N Budget Item Justification

# UNCLASSIFIED

## FY 2001 RDT&E, N PROJECT JUSTIFICATION Exhibit R-2a, RDT&E, N Project Justification

Date: Feb 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204163N      PROJECT NUMBER: X0725  
PROGRAM ELEMENT TITLE: Fleet Communications      PROJECT TITLE: COMMUNICATION AUTOMATION

Cost (\$ in Thousands)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
X0725 Communications Automation	1,730	2,618	3,347	2,896	1,962	2,013	2,066	CONT	CONT

### A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project is a continuing program that provides for automation and communications upgrades for Fleet tactical users. The Naval Modular Automated Communications System II (NAVMACS II) is the network centric Single Messaging Solution (SMS) for the processing, storage, distribution and forwarding of DMS organizational and individual messages to the user's desktop throughout the IT-21 LAN/WAN.

### PROGRAM ACCOMPLISHMENTS AND PLANS:

- FY 1999 PLAN:  
(\$1,730) NAVMACS II/SMS: Continue DMS Tactical Afloat research and development efforts. Provide test and evaluation of DMS components and protocols in SMS/IT-21 network centric environment. Integrate Defense Messaging System (DMS) components and protocols with Simple mail transfer protocol (SMTP) and other legacy protocols. Conduct intersystem integration and testing for shipboard SMS. Begin Fleet automated message information system (FAMIS) interface testing of Smart-push/Warrior-pull with Protocol - Multicast (P-MUL) broadcast. Continued accommodation to C3 technology including migration to WIN NT DII/COE compliant environment.
- FY 2000 PLAN:  
(\$1,141) Continue Tactical DMS/SMS afloat migration efforts. Continue accommodation of emergent technology including Navy Wide Internet (NWI). Conclude FAMIS interface testing of Smart-push/Warrior-pull and P-MUL broadcast. Conduct integration and evaluation of messaging High Assurance Guard (HAG). Conduct fleet developmental testing of SMS.  
(\$1,477) Support Digital Wideband (DWTS) Range Extension development through Enhanced position-location recording system (EPLRS) interface. Conduct concept exploration and risk reduction. Perform test and evaluation, Systems Engineering and Evaluation, preliminary installation design and Integrated Logistics System development.
- FY 2001 PLAN:  
(\$1,359) Continue accommodation of emergent technology including DoD Public Key Infrastructure (PKI). Conduct evaluation and test of band-Width (BW) Migration Tools and Techniques for Low and Medium assurance messaging.  
(\$1,988) Begin Risk Reduction RDT&E for Low-Data DWTS (EPLRS). Conduct DT-I and MS-II DWTS LDR (EPLRS).

R-1 Shopping List - Item No 162-3 of 162-14

# UNCLASSIFIED

Exhibit R-2a, RDT&E, N Budget Project Justification

# UNCLASSIFIED

## FY 2001 RDT&E, N PROJECT JUSTIFICATION Exhibit R-2a, RDT&E,N Project Justification

Date: Feb 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204163N      PROJECT NUMBER: X0725  
PROGRAM ELEMENT TITLE: Fleet Communications      PROJECT TITLE: COMMUNICATION AUTOMATION

PROGRAM CHANGE SUMMARY: FY 99: Reflects Congressional Adjustments associated with Inflation Savings (- \$8K). Transfer of SBIR/STTR (- \$25K), LOCO-GPSI Reprogramming (- \$16K), and Miscellaneous Department Adjustments (- \$19K). FY00: Reflects reprogramming for Low-Data Rate DWTS (EPLRS) (+ \$ 1,485K), and Congressional Adjustment (- \$14K). FY01: IT-21/NWI reduction (- \$ 500K), increase for Low-Data Rate DWTS (EPLRS) (+ \$2,000K), and Miscellaneous Department Adjustments (- \$37K).

### B. (U) OTHER PROGRAM FUNDING SUMMARY:

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To Complete	Total Cost
OPN Line 3050 - Ship Comm Auto - NAVMACS									
11,156 15,129 12,533		3,547	14,383	12,531	22,612	CONT			CONT
OPN Line 3010 - 52DN Ship TAC Comms- DWTS									
11,977 10,322 3,858		2,837	8,860	2,227	2,093	CONT			CONT
O&MN 4A6M - NAVMACS									
600 1,476 1,150		1,158	1,933	1,462	1,503	CONT			CONT
O&MN 4B7N - ILS 0 0 624		567	642	586	58				

C. Acquisition Strategy: N/A

D. Schedule Profile: N/A

R-1 Shopping List - Item No 162-4 of 162-14

# UNCLASSIFIED

Exhibit R-2a, RDT&E,N Budget Project Justification

# UNCLASSIFIED

## FY 2001 RDT&E, N PROJECT COST ANALYSIS Exhibit R-3, RDT&E, N Project Cost Analysis

Date: Feb 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204163N

PROJECT NUMBER: X0725

Exhibit R-3 Cost Analysis (page 1)		PROGRAM ELEMENT					Fleet Communications				Date:	February 1999
APPROPRIATION/BUDGET ACTIVITY 7		0204163N					Fleet Communications				PROJECT NAME AND NUMBER: X0725	
Cost Categories	Contract Method & Type	Performing Activity & Location	Total FY98 and PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
240 Engineering Development	WX	SSC, San Diego	708	485	12/98	1376	12/99	1838	12/00	CONT	CONT	CONT
240 Engineering Development	CPFF	Lockheed Martin	0	0	12/98	100	12/99	150	12/00	CONT	CONT	CONT
240 Engineering Development	Various	Various Labs	0	82	12/98	0	12/99	180	12/00	CONT	CONT	CONT
240 Engineering Development	WX	SSC Charleston	0	928	12/98	540	12/99	505	12/00	CONT	CONT	CONT
240 Engineering Development	CPFF	SEMCOR	0	145	12/98	125	12/99	100	12/00	CONT	CONT	CONT
Subtotal Product Development			708	1,640		2141		2773				
Remarks:												
Subtotal Support												
Remarks												

R-1 Shopping List - Item No 162-5 of 162-14

# UNCLASSIFIED

Exhibit R-3, RDT&E, N Project Cost Analysis

**UNCLASSIFIED**

**FY 2001 RDT&E, N PROJECT COST ANALYSIS**

Exhibit R-3, RDT&E, N Project Cost Analysis

Date: Feb 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N

PROJECT NUMBER: X0725

Cost Categories	Contract Method & Type	Performing Activity & Location	FY 98 and Prior	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
400 System T&E	Various	Various	0	0	Var	150	Var	150	Var	CONT	CONT	CONT
400 System T&E	WX	SSC, San Diego				37		50		CONT	CONT	CONT
Subtotal T&E				0		187		200				
Remarks												
210 Project Management	WX	SSC, San Diego	0	90	12/99	290	12/99	374	12/99	CONT	CONT	CONT
Subtotal Management			0	90		290		374				
Remarks												
Total Cost			708	1730		2618		3347				
Remarks												

R-1 Shopping List - Item No 162-6 of 162-14

**UNCLASSIFIED**

Exhibit R-3, RDT&E, N Project Cost Analysis

## UNCLASSIFIED

### FY 2001 RDT&E,N PROJECT JUSTIFICATION

Exhibit R-2a, RDT&E,N Project Justification

Date: Feb 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N

PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X1083

PROJECT TITLE: Shore to Ship  
Communication System

Cost (\$ in Thousands)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
X1083 Shore to Ship Communications System	12,433	8,065	8,105	6,839	7,045	7,652	7,419	CONT.	CONT.

#### A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project develops communications systems elements which provide positive command and control of deployed ballistic missile submarines (SSBNs). This program provides enhancements to the shore-to-ship transmitting systems, shipboard receiver systems, and development of the Submarine Low Frequency (LF)/Very Low Frequency (VLF) Versa Module Eurocard (VME) Receiver (SLVR) System. Continuing evaluation of this communications system is provided via the Strategic Communications Assessment Program (SCAP). Fixed VLF/LF develops an energy efficient, solid state, power amplifier replacement (SSPAR) for the VLF shore based transmitters of the Submarine Broadcast System, investigates improvement of the radio frequency high voltage insulators, bushings and antenna components used in these stations through the High Voltage Insulator Program (HVIP).

#### (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

##### FY 1999 ACCOMPLISHMENT:

- (\$257) Continued high voltage and antenna component development and test.
- (\$5,248) Commenced development of ELF and Signal Processing integration into SLVR and completed KOV-17 integration into SLVR.
- (\$898) Finalized SCSS 99.0/Phase I design and continue integration.
- (\$3,634) Continued SCAP and conducted Continued Evaluation (CEP).
- (\$2,396) Installed and tested SSPAR Engineering and Manufacture Development Model at NCTAMSLANT Det. La Moure, N.D.

R-1 Shopping List - Item No 162-7 of 162-14

## UNCLASSIFIED

Exhibit R-2a, RDT&E,N Project Justification (X1083)

# UNCLASSIFIED

## FY 2001 RDT&E, N PROJECT JUSTIFICATION

Exhibit R-2a, RDT&E, N Project Justification      Date: Feb 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204163N      PROJECT NUMBER: X1083  
PROGRAM ELEMENT TITLE: Fleet Communications      PROJECT TITLE: Shore to Ship  
Communication System

### FY 2000 PLAN:

- (\$357) Continue high voltage and antenna component development and test. Initiate feasibility study to explore use of low cost composite exit bushings to replace aging high cost ceramic exit bushings.
- (\$2,056) Continue development of the ELF and Signal Processing integration into SLVR..
- (\$1,878) Complete SCSS Phase I design, continue integration and begin implementation.
- (\$3,774) Continue SCAP, conduct Continued Evaluation (CEP) and strategic connectivity threats, and perform analysis.

### FY 2001 PLAN:

- (\$323) Continue high voltage and antenna component development and test. Test candidate composite exit bushings to replace aging high cost ceramic exit bushings.
- (\$1,776) Continue development of the ELF and Signal Processing integration into SLVR.
- (\$1,752) Complete SCSS Phase I integration and implementation.
- (\$4,254) Continue SCAP, conduct continuing evaluations (CEP) and strategic connectivity threats, and perform analysis.

R-1 Shopping List - Item No 162-8 of 162-14

# UNCLASSIFIED

Exhibit R-2a, RDT&E, N Project Justification (X1083)

# UNCLASSIFIED

## FY 2001 RDT&E, N PROJECT JUSTIFICATION

Date: Feb 2000

Exhibit R-2a, RDT&E, N Project Justification

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N

PROGRAM ELEMENT TITLE: Fleet Communications

PROJECT NUMBER: X1083

PROJECT TITLE: Shore to Ship  
Communication System

(U) PROGRAM CHANGE SUMMARY: FY 99: Reflects Congressional reductions associated with Inflation Savings - \$62K. Transfer for SBIR/STTR (- \$322K), LOCO-GPSI Reprogramming (- \$115K) and Miscellaneous Department Adjustments (- \$660K). FY00: Reflects Congressional Adjustment (- \$43K). FY01: Reflects an increase to Continued Evaluation Program (CEP) (+ \$400K), and Miscellaneous Department Adjustments (- \$58K).

### B. (U) OTHER PROGRAM FUNDING SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To Complete	Total Cost
*OPN Line 3107 Shore LF	13,922	36,158	31,433	19,250	4,390	14,059	19,325	CONT	CONT
OPN Line 3147 Submarine LF/VLF VME Receiver (formerly Advanced VLF Receiver)	16,114	0						CONT	CONT
O&MN 4A6M	17,878	20,853	18,733	18,841	22,057	27,015	32,275	CONT	CONT

\*This program consolidates 3147 - Advanced VLF Receiver beginning in FY00.

R-1 Shopping List - Item No 162-9 of 162-14

# UNCLASSIFIED

Exhibit R-2a, RDT&E, N Project Justification (X1083)



**UNCLASSIFIED**

FY 2001 RDT&E, N PROJECT JUSTIFICATION

Date: Feb 2000

Exhibit R-2a, RDT&E, N Project Justification

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204163N      PROJECT NUMBER: X1083  
PROGRAM ELEMENT TITLE: Fleet Communications      PROJECT TITLE: Shore to Ship  
Communication System

C. (U) ACQUISITION STRATEGY:

FY 1999

Program Milestones

FY 2000

FY 2001

T&E Milestones

3Q SLVR OT-III  
(SLVR/TRIDENT FOT&E)

3 / 4Q DT/OT IVB  
SLVR on SSN

3 / 4 Q SLVR DT/OT IVA  
(REM into SLVR on TRIDENT)

D. (U) SCHEDULE PROFILE: See paragraph C.

R-1 Shopping List - Item No 162-10 of 162-14

**UNCLASSIFIED**

Exhibit R-2a, RDT&E, N Project Justification (X1083)

**UNCLASSIFIED**  
FY 2001 RDT&E, N PROJECT COST ANALYSIS

Exhibit R-3, RDT&amp;E,N Project Cost Analysis

Date: Feb 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N

PROJECT NUMBER: X1083

Cost Categories	Contract Method & Type	Performing Activity & Location	FY 98 and Prior	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
240 Engineering Support	CPIF	Rockwell, TX	13,468	2,396	N/A	0	N/A	0	N/A	Complete	16,197	N/A
240 Engineering Support	CPFF	APL/JHU Baltimore, MD	16,826	4,118	11/98	3,434	11/99	3,659	10/00	CONT	CONT	CONT
240 Engineering Support	WR	NCCOSC, San Diego, CA	23,494	3,918	11/98	1,547	11/99	2,007	11/00	CONT	CONT	N/A
240 Engineering Support	WR	Miscellaneous Labs, NUWC	3,786	890	11/98	1,683	11/99	1,572	11/00	CONT	CONT	N/A
240 Engineering Support	WR	U.S. Army, Monmouth, NJ	3,172	330	11/98	288	11/99	130	11/00	CONT	CONT	N/A
240 Engineering Support	Various	Various	0	0	N/A	0	N/A	0	N/A		0	
Subtotal Product Development			60,746	11,652		6,952		7,368				

Remarks:

R-1 Shopping List - Item No 162-11 of 162-14

**UNCLASSIFIED**

Exhibit R-3, RDT&amp;E,N Project Cost Analysis

# UNCLASSIFIED

## FY 2001 RDT&E, N PROJECT COST ANALYSIS

Exhibit R-3, RDT&E, N Project Cost Analysis

Date: Feb 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204163N

PROJECT NUMBER: X1083

Cost Categories	Contract Method & Type	Performing Activity & Location	FY98 and Prior	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
400 System T&E	Various	Various	400	225	11/98	625	11/99	297	11/00	CONT	CONT	
Subtotal T&E			400	225		625		297				
Remarks												
210 Program Management	Various	Various	2,241	556	11/98	488	11/99	440	11/00	CONT	CONT	
Subtotal Management			2,241	556		488		440				
Remarks												
Total Cost			63,387	12,433		8,065		8,105				
Remarks												

R-1 Shopping List - Item No 162-12 of 162-14

# UNCLASSIFIED

Exhibit R-3, RDT&E, N Project Cost Analysis

# UNCLASSIFIED

## FY 2001 RDT&E, N PROJECT JUSTIFICATION

Exhibit R-2a, RDT&E, N Project Justification Date: Feb 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204163N PROJECT NUMBER: X0795  
 PROGRAM ELEMENT TITLE: Fleet Communications PROJECT TITLE: MEECN

Cost (\$ in Thousands)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
X0795 MEECN	695	688	560	524	698	741	759	CONT	CONT

### A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION

Support of Minimum Essential Emergency Communications Network (MEECN). MEECN is the Tri-Service communication system which ensures delivery of Emergency Action Messages (EAMs) to our strategic platforms. Because of substantial downsizing in the number of MEECN assets, such as the CINC Airborne Command Post (ABNCP) fleet, it is necessary to improve the range, timeliness and reliability of MEECN communications to maintain connectivity to the platforms. This project identifies, researches, and develops improvements to the MEECN primarily in the Very Low Frequency and Low Frequency (VLF/LF) ranges of MEECN. The new High Data Rate (HIDAR) mode, which greatly reduces message transmission time while providing the performance of low data rate modes, has been deployed. Potential improvements in mode design and signal processing are continually being investigated for MEECN application.

### FY 1999 ACCOMPLISHMENTS:

- (\$264) Continued Turbo Code application to MEECN Modes.
- (\$215) Initiated development of improved MEECN Mode.
- (\$161) Initiated study to integrate NONAP and Signal Separator AJ algorithms.
- (\$40) Investigated HIDAR/Block II compatibility.
- (\$15) Continued crypto replacement coordination.

R-1 Shopping List - Item No 162-13 of 162-14

# UNCLASSIFIED

Exhibit R-2a, RDT&E, N Project Justification (X0795)

UNCLASSIFIED

FY 2001 RDT&E, N PROJECT JUSTIFICATION

Exhibit R-2a, RDT&E, N Project Justification Date: Feb 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204163N PROJECT NUMBER: X0795  
PROGRAM ELEMENT TITLE: Fleet Communications PROJECT TITLE: MEECN

FY 2000 PLAN:

- (\$302) Complete Turbo Code application to MEECN Modes.
- (\$204) Continue development of improved MEECN Mode.
- (\$167) Complete study to integrate NONAP and Signal Separator AJ algorithms.
- (\$15) Continue crypto replacement coordination.

FY 2001 PLAN:

- (\$220) Complete improved MEECN Mode standards.
- (\$308) Incorporate Mode standard software in MEECN Test Bed for performance evaluation.
- (\$32) Investigate applicability of commercial programmable crypto devices to the MEECN.

(U) PROGRAM CHANGE SUMMARY: FY 99: Reflects Congressional Adjustments associated with Inflation Savings (- \$3K). Transfer of SBIR/STTR (- \$17K), LOCO-GPSI Reprogramming (- \$7K). FY00: Congressional Adjustment (- \$4K). FY01: IT-21/NWI reduction (- \$40K), MEECN (- \$98K) and Miscellaneous Department Adjustments (- \$8K).

B. (U) OTHER PROGRAM FUNDING SUMMARY

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete CONT	Total Cost CONT
O&MN 4A6M	495	715	554	553	732	765	782		

C. (U) ACQUISITION STRATEGY: Not applicable.

D. (U) SCHEDULE PROFILE: Not applicable.

R-1 Shopping List - Item No 162-14 of 162-14

UNCLASSIFIED

Exhibit R-2a, RDT&E, N Project Justification (X0795)

**UNCLASSIFIED**  
**EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0204229N**

**PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PLANNING CENTER**

**(U) COST: (Dollars in Thousands)**

<u>Project Number &amp; Title</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
A0545 Tomahawk	<u>Budget</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	<u>Program</u>
A1784 Theater Mission Planning Center	\$147,314*	\$139,522	\$89,565	\$52,483	\$34,891	\$13,785	\$14,003	Continuing	Continuing
	\$2,479	\$1,895	\$1,871	\$22	\$28	\$28	\$28	0	\$96,745
<b>TOTAL</b>	<b>\$149,793</b>	<b>\$141,417</b>	<b>\$91,436</b>	<b>\$52,505</b>	<b>\$34,919</b>	<b>\$13,813</b>	<b>\$14,031</b>	<b>Continuing</b>	<b>Continuing</b>

Quantity of RDT&E Articles

12 EDM

\*FY99 budget reflects a \$98,573K Congressional add for the Tactical Tomahawk Program (A2658), which has been revised by \$227K for Congressional undistributed adjustments; by \$2,427K for a Small Business Innovative Research (SBIR) assessment; and by \$446K for Inflation savings. The FY99 budget also reflects a \$1,000K Congressional Add for Alternate Turbine Engine (A2659), which has been revised by \$2K for Congressional undistributed adjustments; and by \$24K for a Small Business Innovative Research (SBIR) assessment and by \$5K Inflation savings.

**(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:**

(U) The Tomahawk Weapons System (TWS) provides the Tomahawk cruise missile attack capability against targets on land (Tomahawk Land Attack Missile (TLAM)). The TLAM can be fitted with either Conventional unitary warhead (TLAM/C), Nuclear warhead (TLAM/N) or submunition Dispenser (TLAM/D). This program ensures that the TWS exploits state-of-the-art technology to preserve the efficiency of this proven weapon system.

(U) The Tomahawk project includes all missile development; mission planning system development, and submarine and surface ship weapons control development.

(U) The Tomahawk TLAM Block III system upgrade (IOC March 93) incorporated the Global Positioning System (GPS) capability; provided a smaller, lighter warhead with variable fuze, extended range, Time of Arrival, and improved accuracy for low contrast matching of Digital Scene Matching Area Correlator. The Tactical Tomahawk (TT) Weapons program, beginning in FY 1998, will provide the tactical commander a quick reaction response capability as well as improved flexibility, accuracy, and lethality.

(U)The Theater Mission Planning Center (TMPC) project provides for the TMPC and the Afloat Planning System (APS), a shipboard version of TMPC. TMPC and APS provide mission planning and employment support information for both the nuclear (TMPC only) and conventional TLAM. The TMPC/APS software development decreases mission planning time and increases the quality and accuracy of each mission. TMPC provides mission planning at the theater level and is designed for high rate production responsive to national/strategic requirements. APS provides mission planning at the Battle Group level that is responsive to the needs of the tactical situation. Tomahawk Strike Planning Tools are comprised of two elements. The Mission Distribution System (MDS) is a subset of TMPC, and APS also deployed as the stand-alone TLAM employment system, that support the effective employment of TLAM by the Force Level Tomahawk Strike Coordinator (TSC). The Electronic Tomahawk Employment Planning Package (ETEPP) provides the Tomahawk user with command and control information needed to employ Tomahawk missions.

(U) The Tomahawk Weapons Control System provides launch capability for surface and submarine platforms. Surface Advanced Tomahawk Weapons Control System (ATWCS) Track Control Group Replacement completed Initial Operational Capability (IOC) in FY98. Launch Control Group Replacement will IOC in FY00. Submarine ATWCS Block 1/C Mod 0/1 and Mod 2 will complete and deliver in FY00. Tactical Tomahawk Weapons Control Systems enters Engineering and Manufacturing Development in FY99 with IOC planned for FY03.

(U) These efforts provide battle-group tactical flexibility and responsiveness while maximizing TWS wartime capability.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

**R-1 Item No. 163**  
**UNCLASSIFIED**

Exhibit R-2, RDT&E Budget Item Justification  
 (Exhibit R-2, Page 1 of 14)

**UNCLASSIFIED**

**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0204229N**

**PROJECT NUMBER: A0545**

**PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION  
PLANNING CENTER**

**PROJECT TITLE: TOMAHAWK**

**(U) COST: (Dollars in Thousands)**

<b>Project Number &amp; Title</b>	<b>FY 1999</b>	<b>Budget</b>	<b>FY 2000</b>	<b>Estimate</b>	<b>FY 2001</b>	<b>Estimate</b>	<b>FY 2002</b>	<b>Estimate</b>	<b>FY 2003</b>	<b>Estimate</b>	<b>FY 2004</b>	<b>Estimate</b>	<b>FY 2005</b>	<b>Estimate</b>	<b>To</b>	<b>Complete</b>	<b>Program</b>	<b>Total</b>
A0545 Tomahawk		\$147,314		\$139,522		\$89,565		\$52,483		\$34,891		\$13,785		\$14,003		Continuing	Continuing	
<b>TOTAL</b>		<b>\$147,314</b>		<b>\$139,522</b>		<b>\$89,565</b>		<b>\$52,483</b>		<b>\$34,891</b>		<b>\$13,785</b>		<b>\$14,003</b>		<b>Continuing</b>	<b>Continuing</b>	

**Quantity of RDT&E Articles**

**12 EDM**

**(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:**

(U) The TOMAHAWK Cruise Missile has been designed to accurately attack land targets from seaborne platforms at great distances from the launch platform (Tomahawk Land-Attack Missile (TLAM)). The TLAM can be produced with either a single conventional warhead (TLAM/C), a submunition dispenser (TLAM/D), or a nuclear warhead (TLAM/N).

(U) The Tomahawk development program (Project A0545), beginning with FY 1998, contains all costs for the Tactical Tomahawk (TT) program including the missile, weapons control systems, both surface ship and submarine, and the Tomahawk command and control systems (TC2S).

(U) The last fielded upgrade to the Tomahawk system was designated Block III. This effort added a GPS capability, a smaller, lighter warhead, a time of arrival calculation, added range, and an updated Digital Scene Matching Area Correlator for low contrast matching. The missile development covered by this budget, Tactical Tomahawk provides a comprehensive baseline upgrade to the Tomahawk Weapon System including the missile, weapons control systems, and mission planning systems. The upgrade will improve system flexibility, responsiveness, accuracy and lethality. The essential elements of the TT are upgrades to the guidance, navigation, control, and mission computer systems of the missile along with the associated Command and Control (C2) systems and weapons control systems. TT will provide a UHF Satcom data link to enable the missile to receive in-flight mission modification messages, to transfer health and status messages, and to broadcast Battle Damage Indication (BDI) messages. TT also includes the development of a high anti-jam GPS receiver and antenna system for the missile.

(U) The weapons control development portion of the project is centered on the Tactical Tomahawk Weapons Control System (TTWCS), being introduced into the surface and submarine fleets. The TTWCS advancements are increase data throughput thereby reducing the time needed to execute missile preparation and launch sequences, and improving strike coordination capabilities.

**R-1 Item No. 163  
UNCLASSIFIED**

**UNCLASSIFIED**

**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE:** February 2000

**BUDGET ACTIVITY:** 7

**PROGRAM ELEMENT:** 0204229N

**PROGRAM ELEMENT TITLE:** TOMAHAWK AND THEATER MISSION  
PLANNING CENTER

**PROJECT NUMBER:** A0545  
**PROJECT TITLE:** TOMAHAWK

**((U)) PROGRAM ACCOMPLISHMENTS AND PLANS:**

**1. FY 1999 ACCOMPLISHMENTS:**

- (U) [\$4,200] Continued development and delivery of software for SSN 688 MK2 Block 1C Mod 0/1 and Mod 2.
- (U) [\$143,114] Continued TT Engineering and Manufacturing Development including mission planning and weapons control development.

**2. FY 2000 PLAN:**

- (U) [101,419] Continue development of Tactical Tomahawk missile leading to System CDR. Continue missile prototype fabrication and ground testing to begin Development Testing (DT-1, 2) in 2001.
- (U) [\$38,103] Continue development of common launch and track control systems for surface ship and submarine platforms for the new Tactical Tomahawk baseline. Critical Design Review leading to Development Testing of entire system in 2001.

**3. FY 2001 PLAN:**

- (U) [17,296] Conduct Land Based System Integration Tests of redesigned surface and submarine weapons control systems to the Tactical Tomahawk Baseline. Commit to System Operational Assessment.
- (U) [\$17,678] Complete and install advanced design of Tomahawk command, control, and mission planning system for full system Operational Assessment.
- (U) [\$54,591] Conduct Development Testing of missile ending with Operational Assessment (OA).

**R-1 Item No. 163**  
**UNCLASSIFIED**



**UNCLASSIFIED**

**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0204229N**

**PROJECT NUMBER: A0545**

**PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION  
PLANNING CENTER**

**PROJECT TITLE: TOMAHAWK**

**(U) B. PROGRAM CHANGE SUMMARY**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>
(U) FY 2000 President's Budget:	\$163,123	\$145,317	\$107,895
(U) Appropriated Value:	\$163,732	\$140,317	
(U) Adjustments from President's Budget:	-\$15,809	-\$5,795	-\$18,330
(U) FY2001 President's Budget Submit:	\$147,314	\$139,522	\$89,565

**CHANGE SUMMARY EXPLANATION:**

(U) Funding: The FY 1999 net decrease of \$15,809 thousand reflects a \$3,515 thousand decrease for Small Business Innovative Research assessment, a \$13 thousand decrease for Federal Technology Transfer and a \$12,281 thousand decrease for the Navy's reprioritization of requirements. The FY 2000 net decrease of \$5,795 thousand reflects a \$5,000 thousand decrease for a Congressional reduction and a \$795 thousand decrease for an Across-the-Board Congressional rescission. The FY 2001 net decrease reflects a \$1,032 thousand decrease for Strategic Sourcing Plan savings and Navy Working Capital Fund adjustments, a \$18,000 thousand decrease associated with reduced developmental test and evaluation efforts, a \$581 thousand decrease for revised economic assumptions, and a \$254 thousand decrease for reprioritization of requirements within the Navy; offset by a \$1,400 thousand increase for Theater Mission Planning Center and imagery upgrades, a \$137 thousand increase for Military and Civilian Pay.

(U) Schedule: Technical progress to date of the Tactical Tomahawk AUR dictated a shift of CDR from 1<sup>st</sup> quarter FY00 to 2<sup>nd</sup> quarter FY00. TTWCS PDR changed from 4<sup>th</sup> quarter FY99 to 2<sup>nd</sup> quarter FY00 after the contract was awarded to the winning competitor in May. The original Weapons Control System schedule was based on a generic model without the benefit of a signed contract. After reviewing the contractors proposed approach, the Program Office decided to hold the PDR in 2<sup>nd</sup> quarter FY00.

(U) Technical: Not applicable.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0204229N**

**PROJECT NUMBER: A0545**

**PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION  
PLANNING CENTER**

**PROJECT TITLE: TOMAHAWK**

**(U) C. OTHER PROGRAM FUNDING SUMMARY (Dollars in Thousands)**

	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To	Total
Appn	Budget	Budget	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Complete	Program
WPN	\$23,586	\$433,742	\$0	\$0	\$57,598	\$85,513	\$271,305	\$245,534	Continuing	Continuing
OPN	\$32,185	\$43,641	\$49,625	\$47,492	\$43,803	\$35,083	\$35,258	\$36,652	Continuing	Continuing

**Related RDT&E**

Not applicable.

**(U) D. ACQUISITION STRATEGY:**

In 1998 the Tomahawk Baseline Improvement Program (TBIP) transitioned to the Tactical Tomahawk program. This program is outlined in the Class Justification and approval (CJ&A No AIR-22448) signed by the Under Secretary of the Navy on 29 May 1998. The acquisition strategy, in brief, is to transition the on-going Tomahawk Baseline Improvement Program (TBIP) to Tactical Tomahawk (TT). The Tactical Tomahawk development program is a cost sharing contract between the Government and the Contractor to add capability to the missile. As part of the development, the contractor provided an unsolicited proposal with a fixed unit price of \$569 thousand (FY99) dollars. This price is predicated on the government pursuing and obtaining a five-year, multi-year procurement.

**(U) E. PROGRAM MILESTONES:**

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION  
PLANNING CENTER

PROJECT NUMBER: A0545  
PROJECT TITLE: TOMAHAWK

FY 99

FY 00

FY 01

To Complete

(U) Program Milestones

2Q/02-OA Complete  
4Q/03-IOC  
4Q/03-MS III

(U) Engineering Milestones

2Q/99-PDR Complete

3Q/00-CDR Complete

(U) T&E Milestone

4Q/01-AUR System  
Qual Complete

1Q/03-TECHEVAL Complete  
4Q/03-OPEVAL Complete

(U) Contract Milestones

2Q/02-LRIP One Award  
2Q/03-LRIP Two Award

### Definitions:

AUR - All-Up-Round  
CDR - Critical Design Review  
IOC - Initial Operational Capability  
LRIP - Low Rate Initial Production  
OA - Operational Assessment  
PDR - Preliminary Design Review

R-1 Item No. 163  
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**EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS**

DATE: February 2000

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 02042229N**

**PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION  
PLANNING CENTER**

**PROJECT NUMBER: A0545  
PROJECT TITLE: TOMAHAWK**

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>Target Value of Contract</u>
				<u>Cost</u>	<u>Award Date</u>	<u>Cost</u>	<u>Award Date</u>	<u>Cost</u>	<u>Award Date</u>	
Primary Hardware Development										
All Product Development Costs, 1974- through TBIP Costs in FY 98										
Primary Hardware Development, Tactical Tomahawk Program										
	AUR	Raytheon, Tucson, AZ	\$31,510	\$68,340	11/98	\$53,400	11/99	\$20,350	11/00	Continuing
Launcher Integration	CPFF	NAV/SEA, Wash., DC	\$0	\$15,000	11/98	\$5,100	11/99	\$6,000	11/00	Continuing
	TBD									
	FP	Raytheon, Tucson, AZ	\$2,000	\$2,000	10/98	\$2,000	10/99	\$2,000	10/00	Continuing
	UARC	APL, Laurel, MD	\$3,700	\$3,500	1/99	\$4,400	1/00	\$3,500	1/01	Continuing
	FP	Boeing, St Louis, MO	\$3,000	\$0		\$0		\$2,000	12/00	Continuing
<b>Subtotal Project Development</b>			<b>\$2,216,657</b>	<b>\$88,840</b>		<b>\$64,900</b>		<b>\$33,850</b>		

Remarks: None.

**R-1 Item No. 163  
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**EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS**

DATE: February 2000

PROJECT NUMBER: A0545  
 PROJECT TITLE: TOMAHAWK

PROGRAM ELEMENT: 0204229N  
 PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION  
 PLANNING CENTER

BUDGET ACTIVITY: 7

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>Total Cost</u>	<u>Target Value of Contract</u>
				<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>		
Development Support	Economy Act	NSWC,Dahlgren, VA	\$5,021	\$1,185	11/98	\$1,050	11/99	\$1,123	11/00	Continuing	Continuing
	Economy Act	NAWC-WD,China Lk,CA	\$2,999	\$2,897	11/98	\$1,178	11/99	\$1,588	11/00	Continuing	Continuing
	Economy Act	NSWC,Pt Hueneme, CA	\$0	\$220	11/98	\$242	11/99	\$225	11/00	Continuing	Continuing
	Economy Act	NAWC-AD, Pax River, MD	\$0	\$1,245	11/98	\$1,180	11/99	\$449	11/00	Continuing	Continuing
	Economy Act	NWAD, Corona,CA	\$0	\$219	11/98	\$433	11/99	\$249	11/00	Continuing	Continuing
	Economy Act	NUWC, Newport, RI	\$0	\$982	11/98	\$860	11/99	\$449	11/00	Continuing	Continuing
	SS/CPFF	SAIC, Arlington, VA	\$287	\$1,462	12/98	\$1,416	12/99	\$1,235	12/00	Continuing	Continuing
	Economy Act	NOS, Indian Head, MD	\$0	\$637	11/98	\$1,307	11/99	\$899	11/00	Continuing	Continuing
	Economy Act	NAVSEA (PMS-400), VA	\$200	\$0	11/98	\$0		\$0			
	Economy Act	SPAWAR (PMW-171), CA	\$725	\$406	11/98	\$148	11/99	\$112	11/00	Continuing	Continuing
	CPFF	Boeing, St Louis, MO	\$900	\$0		\$0		\$0		\$900	
	CPFF	LMVF, Valley Forge, PA	\$1,100	\$0		\$0		\$0		\$1,100	
	Economy Act	NAVSEA (PMS-425), VA	\$200	\$0		\$0		\$0			
	Economy Act	NAVSEA (PMS-410), VA	\$1,300	\$0		\$0		\$0			
	CPFF	Raytheon TI, San Jose, CA	\$2,617	\$0		\$0		\$0		\$2,617	
	UARC	APL, MD	\$870	\$4,930	1/99	\$1,245	1/00	\$449	1/01	Continuing	Continuing
Software Development	Economy Act	NSWC, Dahlgren, VA	\$4,443	\$8,709	11/98	\$5,491	11/99	\$2,880	11/00	Continuing	Continuing
	Economy Act	NSWC, Pt Hueneme, CA	\$150	\$661	11/98	\$1,770	11/99	\$337	11/00	Continuing	Continuing
	Economy Act	NUWC, Newport, RI	\$4,749	\$3,654	11/98	\$961	11/99	\$900	11/00	Continuing	Continuing
	SS/CPFF	Raytheon, Arlington, VA	\$5,100	\$0		\$0		\$15,678	12/00	Continuing	Continuing
Mission Planning Systems (TC2S) Weapons Control Systems	CPFF	Lockheed, Philadelphia, PA	\$300	\$26,600	5/99	\$26,000	1/00	\$12,000	1/01	Continuing	Continuing
	CPFF	LMVF, Valley Forge, PA	\$5,636	\$159		\$0		\$0		Continuing	Continuing
TTWCS			\$36,597	\$53,966		\$43,281		\$38,573			
<b>Subtotal Support</b>											

Remarks: Software development includes costs of the entire Tomahawk development program including the missile, weapons control systems, and command and control systems.

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Exhibit R-3, RDT&E Cost Analysis  
 (Exhibit R-3, Page 8 of 14)

## UNCLASSIFIED

## EXHIBIT R-3, FY 2001 RDT&amp;E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204229N

PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION  
PLANNING CENTERPROJECT NUMBER: A0545  
PROJECT TITLE: TOMAHAWK

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		FY 2001 Award Date	FY 2001		Total Cost	Target Value of Contract
				Cost	Date	Cost	Date	Cost	Complete		Cost	Complete		
Developmental, Test & Evaluation	SS/CPFF	Raytheon, Tucson, AZ	\$0	\$0		\$19,574	10/99	\$4,384		10/00			Continuing	Continuing
	Economy Act	COMOPTVEFOR, VA	\$400	\$768	11/98	\$435	11/99	\$409		11/00			Continuing	Continuing
	Economy Act	NAWC, Pt Mugu Tst Spt (CT), CA	\$660	\$1,243	11/98	\$4,808	11/99	\$4,653		11/00			Continuing	Continuing
	Economy Act	NAWC, China Lk Flt Tst Spt (CT), CA	\$1,320	\$2,497	11/98	\$6,524	11/99	\$7,696		11/00			Continuing	Continuing
<b>Subtotal Test &amp; Evaluation</b>			<b>\$2,380</b>	<b>\$4,508</b>		<b>\$31,341</b>		<b>\$17,142</b>						

Remarks: All testing through FY 2001 are Development Testing leading to an Operational Assessment (OA). See schedule.

Contractor Engineering Support

Subtotal Management

Remarks: None.

Total Cost	\$2,255,634	\$147,314	\$139,522	\$89,565	Continuing	Continuing
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R-1 Item No. 163  
UNCLASSIFIEDExhibit R-3, RDT&E Cost Analysis  
(Exhibit R-3, Page 9 of 14)

# UNCLASSIFIED

## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A1784

PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PROJECT TITLE: THEATER MISSION PLANNING PLANNING CENTER CENTER

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Program
A1784 Theater Mission Planning Center	Budget \$2,479	Estimate \$1,895	Estimate \$1,871	Estimate \$22	Estimate \$28	Estimate \$28	Estimate \$28	\$0	\$96,745
<b>TOTAL</b>	<b>\$2,479</b>	<b>\$1,895</b>	<b>\$1,871</b>	<b>\$22</b>	<b>\$28</b>	<b>\$28</b>	<b>\$28</b>	<b>\$0</b>	<b>\$96,745</b>

Quantity of RDT&E Articles Not Applicable

### (U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The TOMAHAWK Theater Mission Planning Center (TMPC) ashore and Afloat Planning System (APS) provide data base generation and processing, flight mission data, command and control information preparation, and distribution for nuclear (TMPC only) and conventional TOMAHAWK Land Attack Missiles. The TMPC project designs and develops software to decrease mission planning time in response to contingency requirements, improves the production of missile data for distribution and provides automated command and control information for employment and strike planning. APS utilizes the TMPC software on down-sized and ruggedized computer hardware for use in support of Afloat Strike Warfare Commanders. This improves battle-group tactical flexibility and responsiveness while maximizing TOMAHAWK Weapon Systems (TWS) warfare capability. The TMPC and APS systems will be compatible with the Navy Command and Control Systems and the TOMAHAWK Strike Planning Tools are comprised of two elements. The Mission Distribution System (MDS) allows TOMAHAWK users the capability to transmit and receive mission data updates in a tactical environment. The Electronic TOMAHAWK Employment Planning Package (ETEPP) provides the TOMAHAWK user with command and control information needed to employ TOMAHAWK missions.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0204229N**

**PROJECT NUMBER: A1784**

**PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PROJECT TITLE: THEATER MISSION PLANNING  
PLANNING CENTER CENTER**

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

**1. FY 1999 ACCOMPLISHMENTS:**

- (U) [\$1,453] Continued TMPC integration of New National Sensors and Software Architectural Enhancements.
- (U) [\$1,026] Supported development of enhancements to the MDS and ETEPP portion of the Tomahawk Strike Planning Tools.

**2. FY 2000 PLAN:**

- (U) [\$1,895] Continue TMPC integration of New National Sensors and Software Architectural Enhancements.

**3. FY 2000 PLAN:**

- (U) [\$1,871] Continue TMPC integration of New National Sensors and Software Architectural Enhancements.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0204229N**

**PROJECT NUMBER: A1784**

**PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PROJECT TITLE: THEATER MISSION PLANNING CENTER**

**(U) B. PROGRAM CHANGE SUMMARY**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>
(U) FY 2000 President's Budget:	\$2,562	\$1,906	\$1,891
(U) Appropriated Value:	\$2,568	1,906	
(U) Adjustments from Pres Budget:	-\$83	-\$11	-\$20
(U) FY 2001 President's Budget Submit:	\$2,479	\$1,895	\$1,871

**CHANGE SUMMARY EXPLANATION:**

(U) Funding: The FY 1999 net decrease of \$83 thousand reflects a \$71 thousand decrease for Small Business Innovative Research assessment and a \$12 thousand decrease for Inflation savings. FY 2000 reflects a \$11 thousand decrease for an Across-the-Board Congressional rescission. The FY 2001 net decrease of \$20 thousand reflects a \$15 thousand decrease for economic assumptions and a \$5 thousand decrease for reprioritization of requirements within the Navy.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

**(U) C. OTHER PROGRAM FUNDING SUMMARY (Dollars in Thousands)**

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
<u>Appn</u>	<u>Budget</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	<u>Program</u>
WPN	\$2,719	\$5,500	\$0	\$0	\$0	\$0	\$0	\$0	Continuing	Continuing
OPN	\$27,141	\$56,905	\$37,742	\$25,953	\$26,807	\$27,880	\$28,474	\$28,946	Continuing	Continuing

**Related RDT&E**

Not applicable.

**R-1 Item No. 163**  
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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204229N

PROJECT NUMBER: A1784

PROGRAM ELEMENT TITLE: TOMAHAWK AND THEATER MISSION PROJECT TITLE: THEATER MISSION PLANNING CENTER

## (U) D. ACQUISITION STRATEGY:

The acquisition strategy for this project is to maintain contractual continuity to develop system updates to continue TMPC integration of New National Sensors and Software Architectural Enhancements.

## (U) E. Program Milestones

TO COMPLETE

FY 1999

FY 2000

FY 2001

Program Milestones

3Q-4Q/99  
Release to Fleet  
TMPC 4.0

Annual Fleet  
Release

Annual Fleet  
Release

Engineering Milestones  
T&E Milestones  
Contract Milestones

TMPC  
APS

TMPC  
APS

TMPC  
APS

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EXHIBIT R-2, FY2001 RDT&E BUDGET ITEM JUSTIFICATION DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROGRAM ELEMENT TITLE: Integrated Surveillance System

IUSS

(U) COST: (Dollars in Thousands)

PROJECT

NUMBER & TITLE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0766 IUSS Detect/ Classif	14,815	11,930	10,603	22,863	22,185	19,804	14,849	CONT.	CONT.
X0758 SURTASS	3,692	5,995	6,325	5,719	6,798	7,679	7,839	CONT.	CONT.
TOTAL	18,507	17,925	16,928	28,582	28,983	27,483	22,688	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Program Element (P.E.) comprises two projects - X0766 and X0758. Project X0766 provides for Integrated Undersea Surveillance Systems (IUSS) Research and Development Projects. Project X0758 is for the Surveillance Towed Array Sensor (SURTASS) development efforts. IUSS provides the Navy with its primary means of submarine detection both nuclear and diesel. The program has undergone a major transition from emphasis on maintaining a large dispersed surveillance force keyed to detection and tracking of soviet submarines to a much smaller force that is effective against modern diesel and nuclear submarines in regional/littoral or broad ocean areas of interest. This transition preserves the ability to continue open ocean surveillance.

(U) The IUSS Research and Development project (X0766) funds Fixed Surveillance Systems (FSS) which encompasses the Sound Surveillance System (SOSUS), the Surveillance Direction System (SDS), the Fixed Distributed System (FDS) and SURTASS Low Frequency Active (LFA) developments. The number of SOSUS processing sites has been reduced and the display equipment used at the remaining sites will be converted to SDS/SSIPS (Shore Signal and Information Processing Segment) to significantly lower life cycle costs and enable system-wide consolidation. SURTASS LFA will provide an active adjunct capability for IUSS passive and tactical sensors to assist in countering the quieter diesel and nuclear threats of the 1990s and beyond. The LFA tasks are directed at detection of slow quiet threats in harsh littoral waters.

R-1 Shopping List-Item No.164 (1 of 19)

# UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification

# UNCLASSIFIED

EXHIBIT R-2, FY2001 RDT&E BUDGET ITEM JUSTIFICATION DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROGRAM ELEMENT TITLE: Integrated Surveillance System

IUSS

(U) In order to continue with reductions in life cycle costs and continue with system-wide consolidation, a long-term goal is to develop a single IUSS processor. The IUSS processor will have the capability to process and display data from future underwater systems (such as the Advanced Deployable System (ADS) and FDS-C). The IUSS processor will also have the capability to replace the legacy systems (SSIPS, SDS, and SURTASS) as they reach end of life and require upgrading.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: Budget Activity 7: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing operational systems.

## B. (U) PROGRAM CHANGE SUMMARY:

FY99 Reflects Congressional reductions associated with Revised Economic Assumptions (-90), SBIR (-454), LOCO GPSI (-121) and Miscellaneous Departmental Adjustments (-200). FY00 Reflects Congressional reduction (-100). Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638 (419). FY01 reflects Miscellaneous Departmental adjustments (-160).

## C. (U) OTHER PROGRAM FUNDING SUMMARY:

X0766:	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL
	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
OPN# 2225	0	0	0	0	0	0	27,033	CONT.	CONT.
OMN 1C3C	25,155	28,040	30,098	29,781	31,106	33,019	39,875	CONT.	CONT.
OPN# 2237	12,452	7,227	5,516	17,229	9,311	19,392	24,229	CONT.	CONT.

X0766 RELATED RDT&E:

R-1 Shopping List-Item No.164 (2 of 19)

# UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification

# UNCLASSIFIED

EXHIBIT R-2, FY2001 RDT&E BUDGET ITEM JUSTIFICATION DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROGRAM ELEMENT TITLE: Integrated Surveillance System

IUSS

- (U) PE 0204311N(Integrated Surveillance System)
- (U) PE 0603785N(Combat Systems Oceanographic Performance Assessment)
- (U) PE 0603747N(Undersea Warfare Advanced Technology)

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL
X0758:	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
OPN #2237	12,452	7,227	5,516	17,229	9,311	19,392	24,229	CONT.	CONT.

X0758 RELATED RDT&E:

- (U) PE 0204311N(Integrated Surveillance System)
- (U) PE 0603785N(Combat Systems Oceanographic Performance Assessment)
- (U) PE 0603747N(Undersea Warfare Advanced Technology)

- D. (U) ACQUISITION STRATEGY: See individual projects for acquisition strategy.
- E. (U) SCHEDULE PROFILE: See individual projects for schedule profiles.

R-1 Shopping List-Item No.164 (3 of 19)

# UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification

# UNCLASSIFIED

EXHIBIT R-2a, FY2001 RDT&E PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT NUMBER: X0766  
PROJECT TITLE: IUSS

(U) COST (Dollars in thousands)

## PROJECT

NUMBER & TITLE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0766 IUSS									
Detect/Classif System									
TOTAL	14,815	11,930	10,603	22,863	22,185	19,804	14,849	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: LFA will provide an active adjunct capability for IUSS passive and tactical sensors to counter the quieter diesel and nuclear threats of the 1990s and beyond. The LFA tasks are directed at detection of slow quiet threats in harsh littoral waters. Functional improvements are delivered to the Fleet in software "Builds". SURTASS/LFA Build #1 (FY 97) included waveform-processing improvements, tactical processing interfaces, and signal processing enhancements. Build #2 (FY 98) included Twin-Line/LFA integration; advanced waveforms for littoral/shallow water operations including doppler sensitive waveforms; and processing algorithms to reduce clutter and reverberation false alarms in shallow water. Also includes Adaptive Beamforming; Integration of tactical decision aids for LFA monostatic and bistatic operation; integration of SURTASS active and passive information processing systems to provide contact association and geographic tracking; and common antisubmarine warfare (ASW) OMI and environmental processing. The LFA task includes development and test of a compact LFA transmit source array for SWATH-P ships.

B. (U) PD18 is involved with the development and maintenance of various IUSS systems. These systems include FDS, FDS-C, SDS, SURTASS, and ADS. The near term objective is to obtain a common Operator Machine Interface (OMI) among currently fielded systems. The long-term goal is to develop a single IUSS processor baseline, with minor maintenance efforts continuing on fielded systems. The existing system architecture, signal processing, contact management, and reporting requirements will be evaluated as well as the requirements for future systems. The development of the IUSS processor will take advantage of automation advancement, array technology improvements, and submarine and surface system commonality.

R-1 Shopping List-Item No.164 (4 of 19)

# UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification x0766

## UNCLASSIFIED

EXHIBIT R-2a, FY2001 RDT&E PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT TITLE: IUSS

### (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 Plans:
  - (U) (\$ 4,856) Initiate development of a common IUSS processing architecture; to include signal, data, and display processing requirements generation, analysis, and contractual planning. Initiate incorporation of ARCI Advanced Processing Builds (APB)-1 architecture to support IUSS processing requirements.
  - (U) (\$ 2,500) Continue investigations and analysis to support preparation of Environmental Impact Statement (EIS) for SURTASS.
  - (U) (\$ 3,500) Continue LFA development and integration of signal/data processing software for littoral/shallow water operations and T-AGOS 23 initial at-sea testing and preparation for Pre-DT testing.
  - (U) (\$ 1,029) Upgrade SURTASS communications capabilities to comply with Naval Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) guidance. Develop capability for increased data transmissions to shore.
  - (U) (\$ 2,500) Prototype, define, and incorporate a common Operator Machine Interface (OMI) for SURTASS and SSIPS/SDS legacy systems.
  - (U) (\$ 430) Conduct Sea Test Planning for T-AGOS 23 DT/OT testing.
2. (U) FY 2000 Plans:

R-1 Shopping List-Item No.164 (5 of 19)

## UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification x0766



## UNCLASSIFIED

EXHIBIT R-2a, FY2001 RDT&E PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT TITLE: IUSS

- (U) (\$ 4,088) Continue design and development of software to transition IUSS to a common processing architecture.
  - (U) (\$ 1,500) Continue scientific research program to support operational deployment of LFA.
  - (U) (\$ 1,600) Conduct DT/OT testing of T-AGOS 23 SURTASS/LFA system.
  - (U) (\$ 2,600) Continue LFA development and integration in support of DT/OT testing of T-AGOS 23 SURTASS/LFA system. Correct software issues identified during conduct of DT/OT testing.
  - (U) (\$ 1,716) Complete transition of SURTASS and SSIPS/SDS to a common OMI. Complete Factory Acceptance Testing (FAT) at each developer facility and install into fielded legacy systems. Prototype requested fleet enhancements to common OMI baseline.
  - (U) (\$ 426) Continue integration of IUSS into the Fleet C4ISR architecture.
3. (U) FY 2001 PLANS
- (U) (\$ 3,240) Continue design and development of software to transition IUSS to a common processing architecture. Verify design and functionality via in lab demonstration testing.
  - (U) (\$ 3,129) Continue sea testing and LFA development to improve performance in shallow water/littoral regions to support ARG operations and to correct LFA OPEVAL deficiencies as required.
  - (U) (\$ 1,500) Continue scientific research program to support operational deployment of LFA.
  - (U) (\$ 950) Continue integration of IUSS into the Fleet C4ISR architecture.

R-1 Shopping List-Item No.164 (6 of 19)

## UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification x0766

# UNCLASSIFIED

EXHIBIT R-2a, FY2001 RDT&E PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT TITLE: IUSS

- (U) (\$ 1,084) Conduct trade-off analysis for LLFA array, processing, array handling and ship modification.
- (U) (\$ 700) Conduct trade-off and mission studies to explore networked ASW system concepts, investment alternatives and development of a community wide strategy for common performance models.

## B. (U) PROGRAM CHANGE EXPLANATION:

(U) Project X0766 Funding: FY99 Reflects reductions associated with Revised Economic Assumptions (-72), SBIR (-345), LOCO GPSI (-90) and Miscellaneous Departmental Adjustments (-161). FY00 Reflects Congressional reduction (-67). FY01 reflects Miscellaneous Departmental adjustments (-91).

(U) Schedule/Technical: FY99, delay start of CLFA development.

## C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL
OPN#	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
2225	0	0	0	0	0	0	27,033	CONT.	CONT.
1C3C	25,155	28,040	30,098	29,781	31,106	33,019	39,875	CONT.	CONT.
2237	12,452	7,227	5,516	17,229	9,311	19,392	24,229	CONT.	CONT.

## (U) RELATED RDT&E:

- (U) PE 0204311N(Integrated Surveillance System)
- (U) PE 0603785N(Combat Systems Oceanographic Performance Assessment)
- (U) PE 0603747N(Undersea Warfare Advanced Technology)

R-1 Shopping List-Item No.164 (7 of 19)

# UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification x0766

UNCLASSIFIED

EXHIBIT R-2a, FY2001 RDT&E PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROGRAM ELEMENT TITLE: Integrated Surveillance System

PROJECT NUMBER: X0766

PROJECT TITLE: IUSS

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R-1 Shopping List-Item No.164 (8 of 19)

UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification x0766

# UNCLASSIFIED

EXHIBIT R-2a, FY2001 RDT&E PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766  
PROJECT TITLE: IUSS

PROGRAM ELEMENT TITLE: Integrated Surveillance System

## D. (U) ACQUISITION STRATEGY:

	FY 1999	FY 2000	FY2001
Program Milestones			LFA MS III 01/01
Engineering Milestones	Build #2 LITTORAL IMPROV 9/98		NCAP A-180R VARIANT 2/01
T&E Milestones	SDS OPEVAL 1Q/99	T-AGOS 23 DLVRY 7/00	SEA TEST NCAP A-180R VARIANT
Contract Milestones			SEA TESTS DT-7/01, OT-9/01

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# UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification x0766

# UNCLASSIFIED

EXHIBIT R-3, FY2001 RDT&E PROJECT COST ANALYSIS

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766

Exhibit R-3 Cost Analysis (page 1)										Date: Feb 2000	
RDT&E/Budget Activity 7			PROGRAM ELEMENT: 0204311N							SURTASS x0766	
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Target Value of Contract
IUSS Common Architecture	CPFF	RSC/LM/DSR	14,948	3,842	12/98	3,928	11/99	2,825	10/00	Cont.	10,595
Environmental Research	WR	ONR	2,000	2,000	10/98	1,500	11/99	1,500	12/00	Cont.	5,000
LFA Improvements	CPFF	RSC/LS	73,238	5,000	10/98	3,155	11/99	1,972	12/00	Cont.	10,127
C4I Integration	CPFF	Various	29,395	1,801	1/99	258	11/99	789	11/00	Cont.	2,848
Various	WX	Various	27,395	1,062	10/98	1,716	11/99	1,796	10/00	Cont.	4,574
Subtotal Product Development			146,976	13,705		10,557		8,882			33,144
Remarks:											
RSC= Raytheon Systems Co. Portsmouth, RI											
LM= Lockheed Martin, Manassas, VA											
TRW= TRW Systems Div., San Diego, CA											
L/S= Lockheed Sanders, Nashua, NH											
DSR = Digital System Resources, Fairfax, VA											
IUSS Common Arch.	WX	Various	840	150	11/98	160	11/99	170	11/00	Cont.	480
LFA Improvements	CPFF	TRW/Various	2,099	325	12/98	395	12/99	395	12/00	Cont.	1115
C4ISR Integration	CPFF	TRW/Various	1,259	100	12/98	168	12/99	161	11/00	Cont.	429

R-1 Shopping List-Item No.164 (10 of 19)

# UNCLASSIFIED

Exhibit R-3, RDT&E PROJECT COST ANALYSIS

## UNCLASSIFIED

EXHIBIT R-3, FY2001 RDT&amp;E PROJECT COST ANALYSIS

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766

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(Exhibit R-3, page 1 of 2)

Exhibit R-3 Cost Analysis (page 2)										Date: Feb 2000		
RDT&E/Budget Activity 7			PROGRAM ELEMENT: 0204311N							SURTASS x0766		
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
IUSS Common Architecture	Var/WX	Various	651	0	Var.	0	Var.	245		Cont.		245
LFA Improvement	Var/WX	Various	1,520	435	Var.	550	Var.	650		Cont.		1,635
Subtotal T&E			2,171	435		550		895		Cont.		1,880
Remarks												
LFA Improvements/C4ISR	Var/WX	Various	1,050	100	Var.	100	Var.	100		Cont.		300
Subtotal Management			1,050	100		100		100		Cont.		300

R-1 Shopping List-Item No.164 (11 of 19)

## UNCLASSIFIED

Exhibit R-3, RDT&amp;E PROJECT COST ANALYSIS

# UNCLASSIFIED

EXHIBIT R-3, FY2001 RDT&E PROJECT COST ANALYSIS

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0766

Remarks									
Total Cost			154,395	14,815	11,930	10,603			37,348
Remarks									

(Exhibit R-3, page 2 of 2)

R-1 Shopping List-Item No.164 (12 of 19)

# UNCLASSIFIED

Exhibit R-3, RDT&E PROJECT COST ANALYSIS

# UNCLASSIFIED

EXHIBIT R-2a, FY2001 RDT&E PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0758

PROGRAM ELEMENT TITLE: INTEGRATED SURVEILLANCE SYSTEM

PROJECT NUMBER & TITLE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0758 SURTASS	3,692	5,995	6,325	5,719	6,798	7,679	7,839	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The SURTASS project comprises the mobile, tactical arm of the Integrated Undersea Surveillance System, providing long range detection and cueing for tactical weapons platforms against both diesel and nuclear powered submarines. With the SOSUS Arrays being placed in a standby status (data available but not continuously monitored), SURTASS must provide the undersea surveillance necessary to support regional conflicts and sea-lane protection. SURTASS has experienced recent passive and active success against diesel submarines operating in shallow water. SURTASS is greatly reducing costs by consolidating logistics support, using Non-Developmental Items and commercial hardware, and increasing operator efficiency through computer aided detection and classification processing. SURTASS development efforts include: twin-line array processing, improved detection and classification/passive automation to counter quieter threats; additional signal processing and bi-static active capability; integrated active and passive operations; improved Battle Group support; and improved information processing. Functional improvements are delivered to the Fleet in software "Builds". Build #1 (FY 95) included source-set formulation and analysis tools, automated line trackers and nuclear source auto-detector. Build #2 (FY 96) included wideband energy trackers, wideband/narrowband feature association, and diesel Full Spectrum Processing (FSP). Build #3 (FY 97) included automated localization and tracking, diesel automated detectors. Build #4 (FY 98) included twin-line integration, automated classification aids that provide surface/subsurface target discrimination and subsurface target classification clues. Build #5 (FY 99) includes bi-static LFA signal processing and integration of active and passive information processing subsystems to improve contact association and geographic tracking performance.

R-1 Shopping List-Item No.164 (13 of 19)

# UNCLASSIFIED

Exhibit R-2a, RDT&E PROJECT JUSTIFICATION X0758



UNCLASSIFIED

EXHIBIT R-2a, FY2001 RDT&E PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0758

PROGRAM ELEMENT TITLE: INTEGRATED SURVEILLANCE SYSTEM

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 PLANS:

- (U) (\$ 1,560) Continue software development for computer aided detection and classification including improvements to nuclear and diesel auto-detectors, integration of active and passive information processing, improved classification aids and Bi-static processing.
- (U) (\$ 800) Continue array improvements and integration and expanded array interoperability
- (U) (\$ 1,332) Software development to support increased data processing on shore to support tactical operations.

2. (U) FY 2000 PLANS:

- (U) (\$ 1,010) Develop processing improvements to support transition to TB-29 common towed array and expand array interoperability.
- (U) (\$ 1,715) Complete software development to support increased data processing on shore to support tactical operations.
- (U) (\$ 1,100) Continue computer aided detection, classification and tracking to improve passive performance to support tactical operations in high clutter environments.
- (U) (\$ 970) Continue software development to improve Bi-Static operations in littoral/shallow water regions.
- (U) (\$ 1,200) Develop software to transition to Common Processor.

3. (U) FY 2001 PLANS:

R-1 Shopping List-Item No.164 (14 of 19)

UNCLASSIFIED

Exhibit R-2a, RDT&E PROJECT JUSTIFICATION X0758

# UNCLASSIFIED

EXHIBIT R-2a, FY2001 RDT&E PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0758

PROGRAM ELEMENT TITLE: INTEGRATED SURVEILLANCE SYSTEM

- (U) (\$ 1,643) Continue processing improvements to support TB-29 operations and expand array interoperability.
- (U) (\$ 2,532) Continue computer aided detection, classification and tracking improvements to improve passive performance to support tactical operations in high clutter environments.
- (U) (\$ 2,150) Continue software development to improve Bi-Static processing in littoral/shallow water regions.

B. FY99 Reflects reductions associated with Revised Economic Assumptions (-18), SBIR (-109), LOCO GPSI (-31) and Miscellaneous Departmental Adjustments (-39). FY00 Reflects Congressional reduction (-33). FY01 reflects Miscellaneous Departmental adjustments (-69).

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL
	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
OPN 2237	12,452	7,227	5,516	17,229	9,311	19,392	24,229	CONT.	CONT.

(U) RELATED RDT&E:

- (U) PE 0204311N(Integrated Surveillance System)
- (U) PE 0603785N(Combat Systems Oceanographic Performance Assessment)
- (U) PE 0603747N(Undersea Warfare Advanced Technology)

R-1 Shopping List-Item No.164 (15 of 19)

# UNCLASSIFIED

Exhibit R-2a, RDT&E PROJECT JUSTIFICATION X0758

# UNCLASSIFIED

EXHIBIT R-2a, FY2001 RDT&E PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0758

PROGRAM ELEMENT TITLE: INTEGRATED SURVEILLANCE SYSTEM

## D. (U) ACQUISITION STRATEGY:

	FY 1999	FY 2000	FY 2001
Program			
Milestones			
	BUILD #5		
Engineering	INTEGRATED		NCAP A-180R
Milestones	PASSIVE IP		VARIANT 2/01
T&E	SEA TEST		SEA TEST
Milestones	INTEGRATED		NCAP A-180R
	TWIN-LINE		VARIANT
Contract			
Milestones			

R-1 Shopping List-Item No.164 (16 of 19)

# UNCLASSIFIED

Exhibit R-2a, RDT&E PROJECT JUSTIFICATION X0758

# UNCLASSIFIED

EXHIBIT R-3, FY2001 RDT&E PROJECT COST ANALYSIS DATE: FEB 2000  
 BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204311N PROJECT NUMBER: X0758  
 PROGRAM ELEMENT TITLE: INTEGRATED SURVEILLANCE SYSTEM

Exhibit R-3 Cost Analysis (page 1)										Date: Feb 2000		
RDT&E/Budget Activity 7			PROGRAM ELEMENT: 0204311N							SURTASS x0758		
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY9 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Passive Auto	CPFF	RSC/APL/DSR	21,735	250	12/98	1,120	11/99	1,681	12/00	Cont.		3,051
Array Improvements	CPFF/WR	RSC/APL/SSC	14,696	750	3/99	800	11/99	1,050	12/00	Cont.		2,600
Processing Improvements	CPFF	RSC/APL/DSR	21,531	1,066	1/99	2,170	11/99	1,289	12/00	Cont.		4,525
Various	Var/WX	Various	14,490	589	10/98	650	11/99	1,050	10/00	Cont		2,289
Subtotal Product Development			72,452	2,655		4,740		5,070				12,465
Remarks: APL = APL/JHU RSC = Raytheon Systems Co. SSC = SPAWAR Systems Center. DSR = Digital System Resources												
Passive/Array improvements	Var/WX	Various	1627	150	10/98	250	10/99	250	10/00	Cont.		650

R-1 Shopping List-Item No.164 (17 of 19)

# UNCLASSIFIED

Exhibit R-3, RDT&E PROJECT COST ANALYSIS

## UNCLASSIFIED

EXHIBIT R-3, FY2001 RDT&amp;E PROJECT COST ANALYSIS

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: X0758

PROGRAM ELEMENT TITLE: INTEGRATED SURVEILLANCE SYSTEM

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Exhibit R-3, RDT&amp;E PROJECT COST ANALYSIS

# UNCLASSIFIED

EXHIBIT R-3, FY2001 RDT&E PROJECT COST ANALYSIS

DATE: FEB 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204311N

PROJECT NUMBER: x0758

Exhibit R-3 Cost Analysis (page 2)										Date: Feb 2000	
RDT&E/Budget Activity 7			PROGRAM ELEMENT: 0204311N							SURTASS x0758	
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY9 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Target Value of Contract
Passive/Array improvements	Var/WX	MISC.	2,126	787	10/98	905	10/99	905	10/00	Cont.	2,597
Subtotal T&E			2,126	787		905		905			2,597
Remarks											
Passive/Array improvements	Var/WX	MISC.	407	100	10/98	100	10/99	100	10/00	Cont.	300
Subtotal Management			407	100		100		100			300
Remarks											
Total Cost			76,612	3,692		5,995		6,325			16,012
Remarks											

(Exhibit R-3, page 2 of 2)

R-1 Shopping List-Item No.164 (19 of 19)

# UNCLASSIFIED

Exhibit R-3, Project Cost Analysis

# UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification										DATE:	February 2000
APPROPRIATION/BUDGET ACTIVITY										R-1 ITEM NOMENCLATURE	
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA7										Amphibious Tactical Support Unit/0204413N	
	COST (\$ in Millions)	Prior Year	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total PE Cost		0.649	1.822	0.000	7.911	13.589	8.424	6.884	0.191	0.000	39.470
SACC AUTOMATION/21980		0.000	0.000	0.000	0.000	5.787	7.467	6.884	0.191	0.000	20.329
MULTI-MISSION LCAC/LCU REPLACEMENT/22231		0.649	1.822	0.000	2.932	7.802	0.957	0.000	0.000	0.000	14.162
AMPHIBIOUS LIGHTERAGE DEVELOPMENT/Y2909		0.000	0.000	0.000	4.979	0.000	0.000	0.000	0.000	0.000	4.979
Quantity of RDT&E Articles											
A. Mission Description and Budget Item Justification: This Program Element supports various amphibious development efforts.											
B. Program Change Summary:											
FY 2000 President's Budget:			FY 1999		FY 2000						
Appropriated Value:			1.869		0.000						
Adjustments to FY 1999 Appropriated Value/			1.869								
FY 2000 President's Budget:											
Funding:											
a. SBIR			-0.015								
b. NWCF Rate Adjustments											
c. Mid-Year Review Reprogrammings (BTR)			-0.018								
d. Inflation Savings			-0.009								
e. Other Execution Adjustments			-0.005								
f. Navy Ops Adjustments											
g. Realign Funding from OPN to RDT&E (Y2909)											
FY 2001 PRES Budget Submit:			1.822		0.000						
Schedule : Not Applicable											
Technical: Not Applicable											

R-1 SHOPPING LIST - Item No. 165 -1 of 165 - 12

Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 1 of 12)

# UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification		DATE:		February 2000																									
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER																											
RDT&E, N/BA7	Amphibious Tactical Spt Unit/0204413N	Amphibious Other C2 (SACC Automation)/21980																											
COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost																				
Project Cost		0.000	0.000	0.000	5.787	7.467	6.884	0.191	20.329																				
RDT&E Articles Qty																													
<p>A. Mission Description and Budget Item Justification: The Supporting Arms Coordination Center (SACC) initiative is to automate the communications and data flow that calls for fire and supporting arms for marine forces ashore. Currently the process is all manual and voice accomplished which, in the future, will be unresponsive to the needs of supported forces. Specifically, this project will develop the Naval Fire Control System and procure two engineering development ship sets for installation. It will also provide interface with the Advance Combat Direction System (ACDS) which brings the automated functions of supporting arms into the coherent tactical picture.</p> <p>FY 1999 Accomplishments: Not Applicable  FY 2000 Plan: Not Applicable  FY 2001 Plan: Not Applicable</p> <p>B. Other Program Funding Summary</p> <table border="1"> <thead> <tr> <th></th> <th>FY1999</th> <th>FY2000</th> <th>FY2001</th> <th>FY2002</th> <th>FY2003</th> <th>FY2004</th> <th>FY2005</th> <th>To Complete</th> <th>Total Cost</th> </tr> </thead> <tbody> <tr> <td>OPN Line 098100 Items Under \$5M</td> <td>0</td> <td>0</td> <td>0</td> <td>346</td> <td>346</td> <td>873</td> <td>873</td> <td>Con't</td> <td>Con't</td> </tr> </tbody> </table> <p>The procurement items are for jam boxes, Automated Distribution Network Systems (ADNS), and racks which will be permanent changeouts to the amphibious ships. These need to be in place in order to permit the connection of the automated SACC capabilities.</p> <p>(U) Related RDT&amp;E: Not Applicable</p> <p>C. Acquisition Strategy: This project is part of a collaboration between N85 and N86 to jointly develop and field a Naval Fire Control System (NFCS) that satisfies the requirements of naval and supported forces. The NFCS is to be an ACAT III program under N86 management.</p>											FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	To Complete	Total Cost	OPN Line 098100 Items Under \$5M	0	0	0	346	346	873	873	Con't	Con't
	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	To Complete	Total Cost																				
OPN Line 098100 Items Under \$5M	0	0	0	346	346	873	873	Con't	Con't																				

R-1 SHOPPING LIST - Item No. 165- 2 of 165 - 12

Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 2 of 12)

UNCLASSIFIED



UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE:	February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA7	PROGRAM ELEMENT NAME AND NUMBER Amphibious Tactical Spt Unit/0204413N	PROJECT NAME AND NUMBER Amphibious Other C2 (SACC Automation)/21980	
<div>D. Schedule Profile:</div> <div><div>Program Milestones</div><div>Engineering Milestones T&amp;E Milestones Contract Milestones</div><div>FY01 - Not Applicable</div><div>To Complete - Conduct a SACC reconfiguration study - Develop SACC specific software functions - Address amphibious ship specific engineering and integration issues</div></div>			

R-1 SHOPPING LIST - Item No. 165 - 3 of 165 - 12

Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 3 of 12)

UNCLASSIFIED

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)												DATE:		February 2000	
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER									
RDT&E,N			Amphibious Tactical Spt Unit/0204413N			Amphibious Other C2 (SACC Automation)/21980									
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract			
Primary Hardware Development										16.729	16.729				
Ancillary Hardware Development											0.000				
Systems Engineering											0.000				
Licenses											0.000				
Tooling											0.000				
GFE											0.000				
Award Fees								0.000		16.729	16.729				
Subtotal Product Development			0.000	0.000		0.000									
Remarks: Software programs to integrate and automate SACC functions															
Development Support Equipment											0.000				
Software Development										2.800	2.800				
Training Development											0.000				
Integrated Logistics Support											0.000				
Configuration Management											0.000				
Technical Data											0.000				
GFE											0.000				
Subtotal Support			0.000	0.000		0.000		0.000		2.800	2.800				
Remarks: Preparation of ship alterations and tech drawings and accompanied support															

R-1 SHOPPING LIST - Item No. 165 - 4 of 165 - 12

Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, Page 4 of 12)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 2)		DATE:		February 2000								
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT		PROJECT NAME AND NUMBER								
RDT&E,N		Amphibious Tactical Spt Unit/0204413N		Amphibious Other C2 (SACC Automation)/21980								
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation											0.000	
Operational Test & Evaluation											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support										0.800	0.800	
Travel											0.000	
Labor (Research Personnel)											0.000	
Overhead											0.000	
Subtotal Management			0.000	0.000		0.000		0.000		0.800	0.800	
Remarks:												
Total Cost			0.000	0.000		0.000		0.000		20.329	20.329	
Remarks:												

R-1 SHOPPING LIST - Item No. 165 - 5 of 165 - 12

Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, Page 5 of 12)

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# UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification										DATE:		February 2000	
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NAME AND NUMBER				PROJECT NAME AND NUMBER							
RDT&E,N/BA7		Amphibious Tactical Spt Unit/0204413N				MCAC Weapons Development (Multi-Mission LCAC and LCU)/22231							
COST (\$ in Millions)		Prior Year	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost		
Project Cost		0.649	1.822	0.000	2.932	7.802	0.957	0.000	0.000		14.162		
RDT&E Articles Qty													
A. Mission Description and Budget Item Justification: (Multi-Mission LCAC) - LCAC Control Enhancements initiates studies that will provide a remote control capability for LCAC and will be integrated and scheduled with developing minesweeping and shallow water mine-countermeasure systems. LCAC Deep Skirt will provide an improved LCAC performance in Sea State 3 and higher, and improved capability near and in the surf zone for explosive lane breaching missions in support of amphibious operations. This project completes at the end of FY 1999. (LCU) - This project supports development and procurement of a technologically advanced heavy lift utility landing craft to complement the high speed, over-the-beach, ship-to-shore amphibious lift of the future.													
FY 1999 Accomplishments (Multi-Mission LCAC):													
- (\$0.335) Complete full scale testing of the Deep Skirt													
- (\$0.450) Conduct MK 58 live fire demo to evaluate LCAC reaction under live fire in the surf zone as part of lane breaching mission.													
- (\$0.495) Update LCAC and propeller mine vulnerability study													
- (\$0.542) Develop air conditioning system improvements to assure adequate in surf zone operations													
FY 2000 Plan: Not Applicable													
FY 2001 Plan (LCU):													
- (\$0.240) Conduct requirements update													
- (\$0.495) Conduct enabling technologies study													
- (\$1.219) Conduct feasibility studies (3 to 5 major variations)													
- (\$0.498) Conduct analysis of alternatives													
- (\$0.480) Conduct market survey analysis													
B. Other Program Funding Summary (LCU)													
		FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	To Complete	Total Cost			
SCN Line 510000 Service Craft		0	0	0	0	0	59.283	59.155	Cont.	Cont.			
(U) Related RDT&E: Not Applicable													
C. Acquisition Strategy (LCU): Feasibility studies will be conducted to determine the best design to meet new Navy requirements for heavy lift utility landing craft and to support a performance specification that will be competitively awarded.													

R-1 SHOPPING LIST - Item No. 165 - 6 of 165 - 12

Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 6 of 12)

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CLASSIFICATION:

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EXHIBIT R-2a, RDT&E Project Justification		DATE:	February 2000
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	
RDT&E,N/BA7	Amphibious Tactical Spt Unit/0204413N	MCAC Weapons Development (Multi-Mission LCAC and LCU)/22231	
D. Schedule Profile (LCU):			
Program Milestones	FY01	To Complete	
	- Mission needs statement approval	- Evaluation of feasibility of alternatives	
	- Assessment of alternatives	- Enabling technology studies	
Engineering Milestones			
T&E Milestones			
Contract Milestones			

R-1 SHOPPING LIST - Item No. 165 - 7 of 165 - 12

Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 7 of 12)

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CLASSIFICATION:

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Exhibit R-3 Cost Analysis (page 1)				DATE:		February 2000				
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT		PROJECT NAME AND NUMBER						
RDT&E,NBA7		Amphibious Tactical Spt Unit/0204413N		MCAC Weapons Development (Multi-Mission LCAC and LCU)/22231						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWC Bethesda, Md						3,975	3,975	
Ancillary Hardware Development	WR	NSWC Bethesda, Md						1,975	1,975	
Systems Engineering	WR	NSWC Bethesda, Md						2,809	2,809	
Licenses									0.000	
Tooling									0.000	
GFE									0.000	
Award Fees									0.000	
Subtotal Product Development			0.000	0.000		0.000		8,759	8,759	
Remarks:										
Development Support Equipment									0.000	
Software Development									0.000	
Training Development									0.000	
Integrated Logistics Support									0.000	
Configuration Management									0.000	
Technical Data									0.000	
GFE									0.000	
Subtotal Support			0.000	0.000		0.000		0.000	0.000	
Remarks:										

R-1 SHOPPING LIST - Item No. 165 - 8 of 165 - 12

Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, Page 8 of 12)

UNCLASSIFIED

CLASSIFICATION:

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Exhibit R-3 Cost Analysis (page 2)				DATE:		February 2000						
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT		PROJECT NAME AND NUMBER								
RD&E,N		Amphibious Tactical Spt Unit/0204413N		MCAC Weapons Development (Multi-Mission LCAC and LCU)/22231								
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC,C and PSNSY, Bost	0.574	1,749							2,323	
Operational Test & Evaluation											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal T&E			0.574	1,749		0.000		0.000		0.000	2,323	
Remarks: Requirement for MCAC Multi-mission is for three (3) prototype installations and demonstration trials.												
Contractor Engineering Support	OPRR	TMA	0.075	0.073	10/98						0.148	
Government Engineering Support	WR	NSWC Bethesda, Md						1,997			1,997	
Program Management Support	CPFF	various			10/98			0.935			0.935	
Travel											0.000	
Labor (Research Personnel)											0.000	
Overhead											0.000	
Subtotal Management			0.075	0.073		0.000		2,932		0.000	3,080	
Remarks:												
Total Cost												
			0.649	1,822		0.000		2,932		8,759	14,162	
Remarks:												

R-1 SHOPPING LIST - Item No. 165 - 9 of 165 - 12

Exhibit R-3, Project Cost Analysis  
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# UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE:		February 2000																																					
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NAME AND NUMBER				PROJECT NAME AND NUMBER																																								
RDT&E,N/BA7		Amphibious Tactical Spt Unit/0204413N				Amphibious Lighterage Development (JMLS Development)/Y2909																																								
COST (\$ in Millions)		Prior Year	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost																																			
Project Cost		0.000	0.000	0.000	4.979	0.000	0.000	0.000	0.000		4.979																																			
RDT&E Articles Qty																																														
<p>A. Mission Description and Budget Item Justification: Joint Modular Lighterage System (JMLS Development) - This project supports development and procurement of technology to develop a service-interoperable causeway lighterage system with the US Army, capable of assembly and operation (in a loaded condition) through Sea State 3. The Defense Planning Guidance includes requirements for SS3 JLOTS capability by FY05. Sea State 3 is defined as significant wave height of 3.5 feet to 5.0 feet per the Joint Logistics Over The Shore (JLOTS) Mission Need Statement. This project includes resolution of technical issues identified during Technical Evaluation and efforts to support/conduct Operation Evaluation of the JMLS system to support transition from an FY98/FY99 Advanced Concept Technology Demonstration (ACTD) to an acquisition program.</p> <p>FY 1999 Accomplishments (JMLS Development):</p> <ul style="list-style-type: none"><li>- JMLS ACTD contractor completed hardware design and began hardware fabrication. (Task accomplished with National Defense Sealift Funds)</li></ul> <p>FY 2000 Plan (JMLS Development):</p> <ul style="list-style-type: none"><li>- JMLS ACTD contractor completes hardware fabrication and Contractor Test and Demonstration. JMLS ACTD Operational Manager, JFCOM conducts Military Utility Assessment (MUA). (Task accomplished with National Defense Sealift Funds)</li><li>- OPEVAL Planning. (Anticipating RDT&amp;E funds to be available, \$0.250)</li></ul> <p>FY 2001 Plan (JMLS Development):</p> <ul style="list-style-type: none"><li>- (\$0.979) Resolve Technical Evaluation issues.</li><li>- (\$4.000) Conduct JMLS OPEVAL.</li></ul> <p>B. Other Program Funding Summary (JMLS Development)</p> <table><tr><td>FY1999</td><td>FY2000</td><td>FY2001</td><td>FY2002</td><td>FY2003</td><td>FY2004</td><td>FY2005</td><td>To Complete</td><td>Total Cost</td></tr><tr><td>CESE Line 6033 Amphib Equipment (OPN)</td><td>0</td><td>20.484</td><td>51,615</td><td>93,173</td><td>104,242</td><td>56,992</td><td>14,643</td><td>515,184</td></tr><tr><td>(U) Related RDT&amp;E: n/a</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> <p>C. Acquisition Strategy (JMLS): The MUA for the JMLS ACTD is scheduled to complete in 3Q FY00 to support a LRIP milestone decision in 4QFY00. Additional hardware will be procured by LRIP to conduct a full OPEVAL in 2Q-3Q FY01. OPEVAL results will be used to support a Full Production milestone decision in FY01.</p> <p>D. Schedule Profile:</p> <table><tr><td>FY00</td><td>FY01</td></tr><tr><td>Program Milestones</td><td>Program Milestones</td></tr><tr><td>- Complete ACTD MUA</td><td>- Resolve TECH EVAL issues.</td></tr><tr><td>- LRIP MS</td><td>- Conduct OPEVAL</td></tr></table>												FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	To Complete	Total Cost	CESE Line 6033 Amphib Equipment (OPN)	0	20.484	51,615	93,173	104,242	56,992	14,643	515,184	(U) Related RDT&E: n/a									FY00	FY01	Program Milestones	Program Milestones	- Complete ACTD MUA	- Resolve TECH EVAL issues.	- LRIP MS	- Conduct OPEVAL
FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	To Complete	Total Cost																																						
CESE Line 6033 Amphib Equipment (OPN)	0	20.484	51,615	93,173	104,242	56,992	14,643	515,184																																						
(U) Related RDT&E: n/a																																														
FY00	FY01																																													
Program Milestones	Program Milestones																																													
- Complete ACTD MUA	- Resolve TECH EVAL issues.																																													
- LRIP MS	- Conduct OPEVAL																																													

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Exhibit R-2a, RDT&E Project Justification  
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CLASSIFICATION:

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Exhibit R-3 Cost Analysis (page 1)				DATE:		February 2000						
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT		PROJECT NAME AND NUMBER								
RDT&E,N/BA7		Amphibious Tactical Spt Unit/0204413N		Amphibious Lighterage Development (JMLS Development)/Y2909								
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development										0.000	0.000	
Ancillary Hardware Development										0.000	0.000	
Systems Engineering										0.000	0.000	
Licenses										0.000	0.000	
Tooling										0.000	0.000	
GFE										0.000	0.000	
Award Fees										0.000	0.000	
Subtotal Product Development			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Development Support Equipment												
Software Development											0.000	
Training Development											0.000	
Integrated Logistics Support											0.000	
Configuration Management											0.000	
Technical Data											0.000	
GFE											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

R-1 SHOPPING LIST - Item No. 165 - 11 of 165 - 12

Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, Page 11 of 12)

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CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 2)				DATE:		February 2000						
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT		PROJECT NAME AND NUMBER								
RDT&E,N		Amphibious Tactical Spt Unit/0204413N		Amphibious Lighterage Development (JMLS Development)/Y2909								
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY's Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation			0.000	0.000				4.000			4.000	
Operational Test & Evaluation											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal T&E			0.000	0.000		0.000		4.000		0.000	4.000	
Remarks:												
Contractor Engineering Support	CPRR	TBD	0.000	0.000				0.900			0.900	
Government Engineering Support	WR	NSWC Bethesda, Md						0.079			0.079	
Program Management Support	CPFF	various						0.000			0.000	
Travel											0.000	
Labor (Research Personnel)											0.000	
Overhead											0.000	
Subtotal Management			0.000	0.000		0.000		0.979		0.000	0.979	
Remarks:												
Total Cost			0.000	0.000		0.000		4.979		0.000	4.979	
Remarks:												

R-1 SHOPPING LIST - Item No. 165 - 12 of 165 - 12

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Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, Page 12 of 12)

# UNCLASSIFIED

## EXHIBIT R-2, FY 2001 RDT&E BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
21427 Surface Tactical Team Trainer (STTT)	11,474	11,083*	4,196	5,679	5,718	6,307	6,945	CONT.	CONT.
W0431 Tactical Aircrew Combat Training System (TACTS)	2,811	2,732	1,585	0	0	0	0	0	56,989***
W0604 Training Range and Instrumentation Development (TRID)	2,043	1,626	1,759	3,552	3,284	3,037	3,096	CONT.	CONT.
W1998 Joint Tactical Combat Training System (JTCTS)	14,837**	7,828	7,783	5,909	4,962	5,046	5,170	CONT.	CONT.
W2124 Air Warfare Training Development (AWTD)	1,780	2,119	2,157	1,918	2,149	2,201	2,246	CONT.	CONT.
X1823 Training and Modeling Systems (TMS)	9,783	8,177	9,579	9,077	8,631	7,457	7,636	CONT.	CONT.
TOTAL	42,728	33,565	27,059	26,135	24,744	24,048	25,093	CONT.	CONT.
Quantity of RDT&E Articles	0	0	3	0	0	0	0	1	

\* Controls reflect an FY00 \$7.5M Congressional add for Battle Force Tactical Training (BFTT) executed under 22449.

\*\* The FY 1999 budget reflects a \$8,054K Congressional add for Rangeless Training System technical evaluation (executed under project unit W2660).

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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 1 of 35)

# UNCLASSIFIED

## EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

### BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The STTT will develop the Battle Force Tactical Training (BFTT) System to provide realistic joint warfare training including a means to link ships together for coordinated Combat System team training using Distributed Interactive Simulation (DIS) protocols.

TACTS provides real-time monitoring and post-exercise debrief of aircrews flying on instrumented training ranges. This system is the primary training tool used by the Naval Strike and Air Warfare Center and the Marine Aviation Weapons and Tactics Squadron.

The TRID program provides development of many range systems including range electronic warfare simulator, advanced weapons training systems, laser training systems, Large Area Tracking Range (LATR), and shallow water range technology.

JTCTS is planned to provide U.S. Navy fleet deployable instrumentation for at sea surface, subsurface, air training and tactics development, and fixed/transportable air range instrumentation for U.S. Navy and U.S. Air Force air training and tactics development. JTCTS incorporates the Defense Modeling and Simulation Office sponsored Distributed Interactive Simulation Protocol Data Unit for interoperability with Navy and other service live, virtual (simulators), and constructive (war games) simulations. JTCTS will initially deliver prototype hardware/software for a mobile/rangeless capability for a Carrier Air Wing 5 (CAG-5) after undergoing development/operational testing. It will further develop, test, and field fixed air range and fixed fleet range hardware/software in subsequent phases of the program. This summary reflects only the USN funding component of the JTCTS.

The AWTD program provides development of many aviation training systems including mission rehearsal simulation technologies and the Aviation Training Technology Integration Facility (ATTIF).

The TMS encompasses the requirements analysis and software development associated with the Navy's Maritime Development Agent function as part of the Joint Simulation System (JSIMS). The BFTT will develop the BFTT Electronic Warfare Trainer (BEWT) and applicable BFTT system software to provide EW operator and team training for Fleet EW Systems.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 2 of 35)

[illegible]

A. Mission Description and Budget Item Justification. The Battle Force Tactical Training (BFTT) Program provides realistic joint warfare training across the spectrum of armed conflict; realistic unit level team training in all warfare areas; a means to link ships together which are in different homeports for coordinated training; external stimulation of shipboard training systems; and simulation of non-shipboard forces. BFTT uses a distributed architecture, integrating existing training systems, and uses Distributed Interactive Simulation (DIS) protocols, with planned migration to High Level Architecture (HLA). BFTT provides ships' Commanding Officers and Battle Group/Battle Force Commanders with the ability to conduct coordinated realistic, high stress, combat system team training as an integral part of the Afloat Training Organization. BFTT provides a baseline capability/system that meets the Operational Requirements Document (ORD). Stimulator/Simulators (STIM/SIM) provides standardized Radio Frequency (RF), Intermediate Frequency (IF), and/or Digital injection into surface ship radars and fire control systems for training of shipboard operators/teams as part of the BFTT System. The BFTT Electronic Warfare Trainer (BEWT) development effort will provide embedded operator and team electronic emissions recognition training capability, integrated into BFTT. Migrate BFTT software from UNIX/TAC based system to Windows-NT/PC.

- FY 1999 ACCOMPLISHMENTS:**
- (\$1.421) BFTT - Developed software required as a result of lessons learned/additional Fleet requirements since BFTT IOC to include SG&C, Display & Debrief, Entity Motioning and Modeling (EM&M) improvements and the initial interface to the Generic Navy Stimulator/Simulator (GNSS).
  - (\$500) BFTT/HLA - Initiated conversion of the DIS protocol based software to the HLA mandated architecture for the Performance Monitoring portion of the BFTT software in accordance with DoD directives.
  - (\$1.300) STIM/SIM - Completed development of the MK 91 NATO Sea Sparrow Missile System Stimulator.
  - (\$2.445) - BEWT - Integrated the BEWT into BFTT.
  - (\$5.808) - Windows NT - Migrated BFTT Software from UNIX/TAC based system to Windows-NT/PC.
- FY 2000 PLANS:**
- (\$1.125) BFTT - Develop tactical link interface/simulation software and fleet-driven requirements into BFTT. Develop stand-alone objective based training software for scenario development.
  - (\$2.500) HLA - Continue conversion of the DIS protocol based software to the HLA mandated architecture for the Scenario Generation and Control portion of the BFTT software in accordance with DoD directives.
  - (\$7.458) BFTT Windows NT - Migration of BFTT software to Windows NT from UNIX OS.

**Exhibit R-2a, RDT&E Project Justification**  
**(Exhibit R-2a, Page 3 of 35)**

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EXHIBIT R-2a, RDT&E Project Justification			DATE:
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER	February 2000
<b>RDT&amp;E, N/BA7</b>	Consolidated Training Systems Development/0204571N	Surface Tactical Team Trainer (STTT)/21427	
FY 2001 PLANS: - (\$2.496) BFTT - Develop link software, develop/integrate new software capabilities, and automate debrief products. - (\$1.700) HLA - Continue conversion of the DIS protocol based software to the HLA mandated architecture for the Entity Monitoring and Modeling portion of the BFTT software in accordance with DoD directives. B. Program Change Summary:			
	FY 2000 President's Budget:	<u>FY 99</u>	<u>FY 01</u>
		5.964	4.660
	Appropriated Value:	11.964	
	Adjustment to FY 1999/2000 Appropriated Value/ FY 2000 President's Budget		11.261
	(a) Revised Economic Assumptions	-0.028	
	(b) FY 99 Cong Add: BFTT Conversion	6.000	
	(c) Inflation Savings	-0.054	
	(d) Civilian Personnel Under Execution	-0.005	
	(e) FY 99 SBIR/STTR Transfer	-0.271	
	(f) FY 99 Midyear Review BTRs	-0.116	
	(g) Actual Update Nov 99	-0.015	
	(h) FY 99 BTRs	-0.001	
	(i) FY 00 Cong Add: BFTT Conversion	7.500	0.041
	(j) Restore Issue 62288 Outsourcing	0.006	-0.308
	(k) SSP Contracts	-0.025	0.011
	(l) NWCF Rates		-0.151
	(m) BSO Realignment	-0.697	
	(n) Balance to R-1 (Issue 66212)	-0.062	0.009
	(o) Across-the-Board Reduction		-0.055
	(p) ICC 0611 (NSWC) : PBD411		-0.011
	(q) Nonpay Pur Inflation: PBD604		
	(r) Active Navy Ops: PBD022C2		
	FY 2001 President's Budget Submit:	11.474	11.083
			4.196

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Exhibit R-2a, RDT&E Project Justification  
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EXHIBIT R-2a, RDT&E Project Justification			DATE:	February 2000					
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER							
<b>RDT&amp;E, N/BA7</b>	Consolidated Training Systems Development/0204571N	Surface Tactical Team Trainer (STTT)/21427							
<p>Funding: The FY 1999 net increase of +\$5.510M was a result of revised economic assumptions (-\$.028M), a FY 99 Congressional Add for BFTT conversion +\$6.000M, a FY 99 SBIR/STTR transfer (-\$.271M), a Civilian Personnel under-execution mark of (-\$.005M), a FY 99 Midyear Review BTR decrease of (-\$.116M), an Inflation Savings decrement of (-\$.054M), and Actual Update in November 1999 decrement of (-\$.015M), and a FY 99 BTR decrease of (-\$.001M). The FY 2000 net increase of +6.722M includes a restoration of outsourcing +\$.006M, a SSP Contracts decrement of (-\$.025M), a Balance to R-1 decrease of (-\$.697M), an across-the-board reduction of (-\$.062M), and a congressional plus up of +7.500M. The FY 2001 net decrease of (-\$.464M) includes a restoration of outsourcing Issue +\$.041M, a SSP Contracts decrement of (-\$.308M), a NWCf Rate increase of +.011M, a BSO realignment decrease of (-\$.151M), a restoration of ICC 0611 (NSWC) of +\$.009M, a Nonpayroll related purchase inflation decrease of (-\$.055M), and a reduction for Active Navy Operations of (-\$.011M).</p>									
Schedule: Not Applicable.									
Technical: Not Applicable.									
C. Other Program Funding Summary:									
	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
OPN Line 276200	23.867	38.581	16.430	37.754	24.150	20.906	23.746	CONT	CONT
O&MN Line 3B4K	8.859	9.041	10.056	9.734	9.348	9.468	9.707	CONT	CONT
Related RDT&E: Not Applicable.									

**Exhibit R-2a, RDT&E Project Justification**  
**(Exhibit R-2a, Page 5 of 35)**

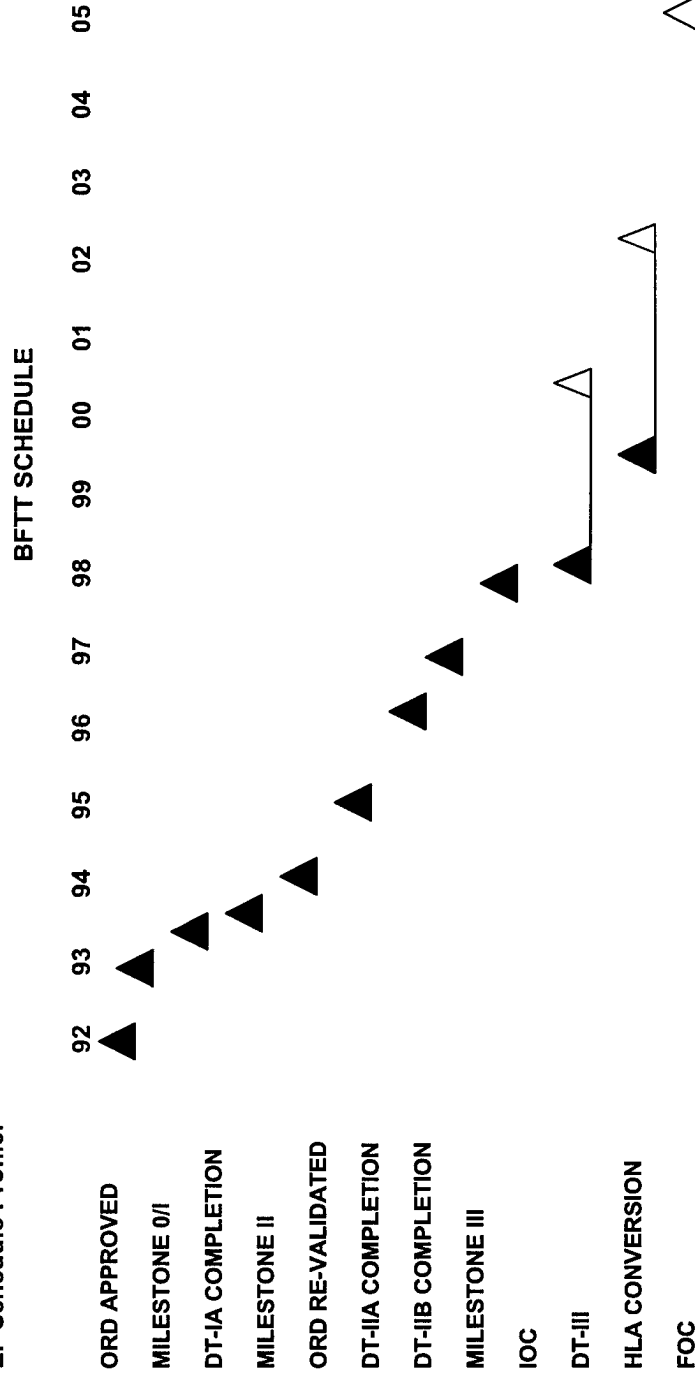
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## EXHIBIT R-2a, RDT&E Project Justification

DATE: <b>February 2000</b>		
APPROPRIATION/BUD GET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
<b>RDT&amp;E, N/BA7</b>	Consolidated Training Systems Development/0204571N	Surface Tactical Team Trainer (STTT)/21427

D. Acquisition Strategy: The BFTT Program is designated as an ACAT IV-M Program consisting of four (4) phases - Concept Exploration and Definition, Demonstration and Validation, Engineering and Manufacturing Development, and Production and Deployment.

### E. Schedule Profile:



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Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 6 of 35)



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Exhibit R-3 Cost Analysis (page 1)				DATE:		February 2000						
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT			PROJECT NAME AND NUMBER							
RDT&E, N/BA7		Consolidated Training Systems Development/0204571N			Surface Tactical Team Trainer – 21427							
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	**	AAI/MD, EWA/WV	10.024	1.490	**	0.000		0.000		0.000	11.514	11.514
Ancillary Hardware Development				0.400		0.600				0.000	0.400	1.000
Systems Engineering	WR/RCP	MULTIPLE	11.101	3.045		3.550		0.700		CONT	CONT.	N/A
Licenses	WR/RCP	MULTIPLE	1.950	0.062		0.025		0.035		CONT	CONT.	N/A
Tooling												
GFE			2.500							0.000	2.500	2.500
Award Fees			0.197	0.160						0.000	0.357	0.357
Subtotal Product Development			25.772	5.157		4.175		0.735		CONT.	CONT.	N/A
Remarks:												
* PY total also includes NSWC PHD and NSWC DD												
** AAI Contract Award 3/98 CPIF, EWA Contract Award 6/98 CPFF												
Development Support Equipment												
Software Development	Various	MULTIPLE	15.534	5.200		5.963		3.026		CONT	CONT.	N/A
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data	WR/RCP	MULTIPLE	5.741	0.660		0.645		0.385		CONT	CONT.	N/A
GFE												
Subtotal Support			21.275	5.860		6.608		3.411		CONT.	CONT.	N/A
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)					DATE:		February 2000					
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT			PROJECT NAME AND NUMBER							
RDT&E, N/BA7		Consolidated Training Systems Development/0204571N			Surface Tactical Team Trainer – 21427							
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value Of Contract
Developmental Test & Evaluation	WR/RCP	NSWC Crane/PHD	3.100	0.157		0.000		0.050		CONT.	CONT.	N/A
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			3.100	0.157		0.000		0.050		CONT.	CONT.	N/A
Remarks:												
Contractor Engineering Support												
Government Engineering Support	WR/RCP	NSWC PHD	1.583	0.300		0.300		0.000		0.000	2.183	2.183
Program Management Support												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management			1.583	0.300		0.300		0.000		0.000	2.183	2.183
Remarks:												
Total Cost			51.730	11.474		11.083		4.196		CONT.	CONT.	N/A
Remarks:												

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems  
Development

PROJECT NUMBER: W0431

PROJECT TITLE: Tactical Aircrew Combat Training  
System (TACTS)

(U ) COST: (Dollars in Thousands)

Project Number & Title	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W0431 Tactical Aircrew Combat Training System (TACTS)	2,811	2,732	1,585	0	0	0	0	0	56,989*
<b>TOTAL</b>	<b>2,811</b>	<b>2,732</b>	<b>1,585</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>56,989*</b>

Quantity of RDT&E Articles: Not Applicable.

\* This amount includes FY90-FY01.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops new TACTS capabilities primarily through the integration of additional types of aircraft and weapons. This requires development of new aircraft interfaces, weapons and countermeasures simulations, and modifications to displays. Software is also developed to produce computer generated Electronic Warfare (EW) threats to enhance the system's ability to provide training in a realistic EW environment. Various other system performance improvements are also developed to make the system more effective and reliable.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$1,000) Weapons Integration - Continued development of a training capability for Joint Stand-Off Weapon (JSOW).
- (U) (\$1,571) System Upgrades - Continued development of block 5.2 software for Control and Computation Subsystem (CCS) and A10 software for P4A Aircraft Instrumentation Subsystem (AIS).
- (U) (\$ 240) Studies/Analysis/T&E - Completed studies and analysis of block 5.2 hardware requirements/design and A10 software requirements.

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Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 9 of 35)

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems  
Development

PROJECT NUMBER: W0431

PROJECT TITLE: Tactical Aircrew Combat Training  
System (TACTS)

### 2. FY 2000 PLAN:

- (U) (\$ 824) Weapons Integration - Complete development of the JSOW training capability for the F/A-18. Develop a similar training capability for the Joint Direct Attack Munitions (JDAM) weapon. Begin integration of JSOW/JDAM within TACTS software builds.
- (U) (\$1,416) System Upgrades- Complete the development of block 5.2 CCS software and A10 P4A AIS software. Develop software modifications to enhance TACTS tracking in areas of marginal coverage. Develop and complete enhancements to the Advanced Display and Debriefing Subsystem in accordance with fleet requirements. Develop block A05 and K05 AIS/AIS Internal (AISII) software variants. Begin the development of CCS software version 6.0.
- (U) (\$ 492) Studies/Analysis/T&E - Begin testing of block 5.2 software and hardware. Develop test procedures for Advance Display and Debriefing Subsystem (ADDS) Enhancement verification. Develop test procedures for A05/K05 AIS/AISI upgrades.

### 3. FY 2001 PLAN:

- (U) (\$600) Weapons Integration - Complete integration of JSOW/JDAM within TACTS software builds.
- (U) (\$765) Systems Upgrades - Complete integration of block 5.2 CCS software and hardware. Complete development and testing of CCS software version 6.0.
- (U) (\$220) Studies/Analysis/T&E - Complete 5.2 range acceptance testing. Conduct ADDS enhancement testing and verification. Conduct testing and verification of AIS/ AISI upgrades at TACTS Ranges. Complete acceptance testing of JSOW/JDAM capabilities.

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Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 10 of 35)

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems  
Development

PROJECT NUMBER: W0431

PROJECT TITLE: Tactical Aircrew Combat Training  
System (TACTS)

### (U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	2,934	2,747	1,714
(U) Appropriated Value:	3,069	2,747	
(U) Adjustments from President's Budget:	-123	-15	-129
(U) FY 2001 President's Budget Submit:	2,811	2,732	1,585

### CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 decrease of \$123 thousand reflects a \$51 thousand reduction for Small Business Innovative Research (SBIR) Assessment, a \$14 thousand reduction for inflation savings, and a \$58 thousand reduction for reprioritization of requirements within the Navy. The FY 2000 decrease reflects a \$15 thousand reduction for an Across-the-Board Congressional rescission. The FY 2001 net decrease of \$129 thousand reflects a net decrease of \$2 thousand due to Strategic Sourcing Plan savings and Navy Working Capital Fund (NWCFF) adjustments, a \$115 thousand reduction for reprioritization of requirements within the Navy, a \$13 thousand decrease for revised economic assumptions, and a \$1 thousand increase for Military and Civilian Pay.

(U) Schedule: The following milestones have been changed due to program restructure:

From	To
A10 DT-II 4Q99/1Q00	A10 DT-II 4Q99/2Q00
Blk 5.2 DT-II 4Q99/1Q00	Blk 5.2 DT-II 4Q99/2Q00

(U) Technical: Not Applicable.

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Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 11 of 35)

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems  
Development

PROJECT NUMBER: W0431

PROJECT TITLE: Tactical Aircrew Combat Training  
System (TACTS)

(U) C. OTHER PROGRAM FUNDING SUMMARY: Not Applicable

### Related RDT&E

(U) P.E. 0604735F (Range Improvement) - Includes funding for joint efforts with USAF.

(U) C. ACQUISITION STRATEGY: The TACTS program is a non-ACAT program. The integrated program teams that develop new TACTS capabilities include contractors whose products and services are obtained by means of competitive award, indefinite deliveries/indefinite quantity, and cost-type contracts. Individual delivery orders are awarded for specific development efforts.

### (U) D. SCHEDULE PROFILE

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>	<u>To Complete</u>
--	----------------	----------------	---------------	--------------------

(U) Program Milestones

(U) Engineering Milestones

(U) T&E Milestones

(U) Contract Milestones

4Q99/2Q00 A10 DT-II  
4Q99/2Q00 Blk 5.2 DT-II

2Q/3Q-01 A05/K05 DT-II  
2Q/3Q-01 Blk 6.0 DT-II

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Exhibit R-2a, RDT&E Project Justification  
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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W0431

PROJECT TITLE: TACTS

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>*Total Prior Yrs Cost</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>Cost to Complete</u>	<u>Target Value of Contract</u>	
				<u>Award Date</u>	<u>Cost</u>	<u>Award Date</u>	<u>Cost</u>	<u>Award Date</u>	<u>Cost</u>		<u>Total Cost</u>	<u>Contract</u>
Systems/Software Development	Various	Various	31,474	1Q/99	2,521	1Q/00	2,190	1Q/01	1,265	0	37,450	
Systems Engineering (Misc. less \$1M)			31,474	2,521	2,190				1,265	0	37,450	
<b>Subtotal Project Development</b>												

Remarks

Miscellaneous

**Subtotal Support**

Remarks

Miscellaneous

**Subtotal Test & Evaluation**

Remarks

**Subtotal Management**

Remarks

**Total Cost**

\* This amount includes FY90-FY98.

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems

PROJECT NUMBER: W0604

PROJECT TITLE: Training Range and Instrumentation Development (TRID)

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
W0604 Training Range and Instrumentation Development (TRID)	2,043	1,626	1,759	3,552	3,284	3,037	3,096	CONT.	CONT.
<b>TOTAL</b>	<b>2,043</b>	<b>1,626</b>	<b>1,759</b>	<b>3,552</b>	<b>3,284</b>	<b>3,037</b>	<b>3,096</b>	<b>CONT.</b>	<b>CONT.</b>

Quantity of RDT&E Articles: Not Applicable.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops specialized instrumentation systems for fleet readiness training while minimizing life cycle costs. Tasks include development of the following: electronic warfare simulators and associated subsystems, target control systems, Large Area Tracking Range (LATR) improvements, underwater technology, ranges interoperability and information architecture, shallow water range activity which includes establishment of capability at Pacific Missile Range Facility Shallow Water Training Range (PMRF SWTR) and assorted Advanced Weapons Training Systems (AWTS), such as Imaging Weapons Training Systems (IWTS), Remote Strafe Scoring System (RSSS), and weapon and countermeasure simulations for use with various range training systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$733) Completed development of Imaging Weapons Training Systems (IWTS) Pre-Planned Product Improvement (P<sup>3</sup>I). Conducted testing of RSSS Product Improvement Program (PIP).
- (U) (\$483) Continued technology development for Continental United States Shallow Water Ranges. Completed test and evaluation of PMRF SWTR.
- (U) (\$369) Continued systems definitions, development of specifications, analysis of concepts, and systems engineering for various projects. Continued systems engineering efforts for range integration and continued development of common range architecture to meet High Level Architecture (HLA) standards. Conducted analyses of design data to ensure that Tactical Training Range (TTR) programs are logistically supportable.
- (U) (\$458) Commenced development of LATR Block 3.0 software upgrade, aircraft integration requirement analyses, prototype developments and testing, and developing LATR system hardware upgrades.

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Exhibit R-2a, RDT&E Project Justification  
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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems

PROJECT NUMBER: W0604

PROJECT TITLE: Training Range and  
Instrumentation Development  
(TRID)

### 2. FY 2000 PLAN:

- (U) (\$522) Commence development of a singular display and debrief capability for all tactical training ranges systems to provide a common operating environment (COE) for the efficient life cycle support. This singular display and debrief capability will support the real-time and post exercise capability, as well as the Information Technology of 21<sup>st</sup> Century (IT-21) initiative. The capability will be based on machine independent code that can be hosted on personal computers. Obtain MS III decision for RSSS Product Improvement Program (PIP).
- (U) (\$521) Commence development of the HLA and Training Enabling Architecture (TENA) for the tactical training ranges systems. Begin development of the modeling and simulation of the west coast training ranges communication systems. Commence development and integration of the tactical training ranges with Command, Control, Communication, Computers and Information (C4I) Global Command and Control System (GCCS). Research integration of embedded instrumentation and tactical training range system with Battle Force Tactical Training (BFTT).
- (U) (\$583) Complete development of LATR Block 3.0 software upgrade, and commence development of Block 4.0 software upgrade. Continue aircraft integration requirements analyses, prototype development and testing, and developing LATR system hardware upgrades.

### 3. FY 2001 PLAN:

- (U) (\$443) Continue development of the display and debrief COE. Establish application program interface which will allow various users to interface to the COE.
- (U) (\$394) Continue development of the HLA and TNA for the tactical training ranges systems. Continue development of the modeling and simulation of the training range communication systems. Continue development and integration of the tactical training ranges with C4I, GCCS, and BFTT.
- (U) (\$250) Complete development of LATR Block 4.0 software upgrade and continue analyses of aircraft integration requirements, prototype development and testing, and developing LATR system hardware upgrades.
- (U) (\$492) Commence research and engineering required to transition Imaging Weapons Training System to a deployable configuration.
- (U) (\$180) Commence development of an update to the existing simulations for the AIM-7M (sparrow) and AIM9/M (sidewinder). (These simulations are used in multiple training systems).

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems

PROJECT NUMBER: W0604

PROJECT TITLE: Training Range and  
Instrumentation Development  
(TRID)

### (U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	2,113	1,635	3,425
(U) Appropriated Value:	2,195	1,635	
(U) Adjustments from President's Budget:	-70	-9	-1,666
(U) FY 2001 President's Budget Submit:	2,043	1,626	1,759

### CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 decrease of \$70 thousand reflects a \$23 thousand reduction for Small Business Innovative Research (SBIR) assessment, a \$10 thousand reduction for inflation savings, a \$13 thousand reduction for Contract and Advisory Services, and a \$24 thousand reduction for reprioritization of requirements within the Navy. The FY 2000 decrease reflects a \$9 thousand reduction for an Across-the-Board Congressional rescission. The FY 2001 net decrease of \$1,666 thousand reflects a \$1,537 thousand reduction for reprioritization of requirements within the Navy, a net decrease of \$110 thousand due to Strategic Sourcing Plan savings and Navy Working Capital Fund (NWCFF) adjustments, a \$20 thousand decrease for revised economic assumptions, and a \$1 thousand increase for Military and Civilian Pay.

(U) Schedule: The following milestones have changed due to program restructure.

From:	To:
RSSS PIP MSIII 2Q/99	RSSS PIP MSIII 2Q/00
Block 3.0 LATR Upgrade IOC 1Q/00	Block 3.0 LATR Upgrade IOC 2Q/00

(U) Technical: Not Applicable.

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems

PROJECT NUMBER: W0604

PROJECT TITLE: Training Range and  
Instrumentation Development  
(TRID)

### (U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
(U) OPN/P-1 Weapons Range Support Equipment	1,227	5,669	5,882	22,834	22,965	16,591	17,805	CONT.

Related RDT&E: Not Applicable.

(U) C. ACQUISITION STRATEGY: The TRID program is a non-ACAT program. The integrated program teams that develop new TRID capabilities include contractors whose products and services are obtained by means of competitive award, indefinite deliveries/indefinite quantity (IDIQ), and cost-type contracts. Individual delivery orders are awarded for specific development efforts.

### (U) D. SCHEDULE PROFILE

	FY1999	FY 2000	FY 2001	To Complete
(U) Program Milestones	1Q SWR Phase I IOC	2Q Block3.0 LATR Upgrade IOC 2Q RSSS PIP MS III	1Q Block 4.0 LATR Upgrade IOC	4Q/02 IWTS IOC
(U) Engineering Milestones			4Q AIM-7/9 SIM Upgrade SRR	2Q/02 AIM-7/9 Upgrade PDR
(U) T&E Milestones	4Q/99-1Q/00 P <sup>3</sup> I DT-II 4Q Block 3.0 LATR Upgrade DT III	4Q Block 4.0 LATR Upgrade DT III		
(U) Contract Milestones				

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

DATE:

PROJECT NUMBER: W0604

PROJECT TITLE: TRID

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
Systems Engineering and Software Development (Misc. less than \$1M)	Various	Various	78,591	1,154	1Q/99	1,276	1Q/00	1,357	1Q/01	CONT.	CONT.	CONT.
<b>Subtotal Project Development</b>			78,591	1,154		1,276		1,357		CONT.	CONT.	
Remarks												
Miscellaneous	Various	Various	10,288	204	1Q/99	250	1Q/00	302	1Q/01	CONT.	CONT.	CONT.
<b>Subtotal Support</b>			10,288	204		250		302		CONT.	CONT.	
Remarks												
Miscellaneous	Various	Various	0	685	1Q/99	100	1Q/00	100	1Q/01	CONT.	CONT.	CONT.
<b>Subtotal Test &amp; Evaluation</b>			0	685		100		100		CONT.	CONT.	
Remarks												
<b>Subtotal Management</b>			0	0		0		0			0	
Remarks												
<b>Total Cost</b>			88,879	2,043		1,626		1,759		CONT.	CONT.	

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

Date: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems

PROJECT NUMBER: W1998

PROJECT TITLE: Joint Tactical Combat Training System (JTCTS)

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>To Program</u>
W1998 Joint Tactical Combat Training System (JTCTS)									
	14,837*	7,828	7,783	5,909	4,962	5,046	5,170	CONT.	CONT.
<b>TOTAL</b>	<b>14,837</b>	<b>7,828</b>	<b>7,783</b>	<b>5,909</b>	<b>4,962</b>	<b>5,046</b>	<b>5,170</b>	<b>CONT.</b>	<b>CONT.</b>
Quantity of RDT&E Articles	0	0	3	0	0	0	1	CONT.	CONT.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Joint Tactical Combat Training System (JTCTS) is planned to provide fixed, transportable, and mobile range instrumentation for the USN and USAF for both shore-based and deployable applications. The fixed application provides shore-based tactical aircrew training while the mobile application will provide deployable at-sea single platform to multi-platform (surface ship, submarine and aircraft) and Naval Expeditionary Force multi-warfare training. To accomplish this, the JTCTS instrumentation is being designed to develop and transmit exercise scenarios; simulate/stimulate all exercise participants sensors/weapons with the exercise scenario, track all exercise participants and events, e.g., weapons engagements; and provide accurate, realistic, and timely exercise feedback. JTCTS is building on technology developed for existing Tactical Training Ranges Systems.

Based on the reduced funding profile that has occurred since the FY98 President's Budget, the JTCTS program has been restructured. The program schedule has been restructured to a phased approach which develops/fields a mobile, rangeless capability first; followed by the development/fielding of a fixed air range capability and finally the development/fielding of a fleet battle group capability. The first phase will meet an urgent fleet requirement for a mobile rangeless air combat capability delivered to Carrier Air Wing Five (CVW-5) in FY00. The CVW-5 requirement will be met by leaving in place the JTCTS development prototype after operational testing. The mobile rangeless engineering and manufacturing development (E&MD) system consists of a "core" for mission control and debrief capability and 12 participant instrumentation packages (PIPs).

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems

PROJECT NUMBER: W1998

PROJECT TITLE: Joint Tactical Combat Training System (JTCTS)

The fixed range phase will begin development in FY01 and continue through FY05. The fixed range "core" will build upon the mobile "core" resulting in a greatly enhanced version that will interface with existing training range systems such as the Integrated Air Defense system. The fixed range phase will culminate in the testing and development of the E&MD core to the Naval Strike Air Warfare Center (NSAWC), NAS Fallon NV. The "core" and interfaces will be supplemented by 115 PIPs procured with Aircraft Procurement Navy (APN) funding. This developmental system will be left in place to satisfy fleet requirements to replace the aging TACTS system at NSAWC Fallon.

## (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

### 1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$3,635) Continued the E&MD portion of the contract for the mobile rangeless capability to include software/hardware development and contractor acceptance testing.
- (U) (\$1,891) Conducted system platform integration testing. Continued government development operational test preparation.
- (U) (\$1,257) Monitored contractor progress and coordinated subsystem development/test.
- (U) (\$8,054) Conducted a Rangeless Training System integration technical evaluation (project unit W2660).

### 2. FY 2000 PLAN:

- (U) (\$4,284) Complete E&MD portion of the contract for the mobile rangeless capabilities. Deliver and install mobile rangeless system on CV-63/CVW-5.
- (U) (\$3,544) Conduct government development and operational testing. Monitor contractor hardware/software development and hardware/software integration. Leave prototype JTCTS system in place for fleet use.

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Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 20 of 35)

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems

PROJECT NUMBER: W1998

PROJECT TITLE: Joint Tactical Combat Training System (JTCTS)

### 3. FY 2001 PLAN:

- (U) (\$5,100) Begin repackaging PIP hardware for surface ship tracking application. Begin development of fixed range application.
- (U) (\$2,683) Monitor contractor hardware/software development.

### (U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	9,412	7,871	7,933
(U) Appropriated Value:	9,442	7,871	
(U) Adjustments from President's Budget:	+5,425	-43	-150
(U) FY 2001 President's Budget Submit:	14,837	7,828	7,783

### CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 net increase of \$5,425 thousand reflects a \$109 thousand reduction (W1998) and a \$402 thousand reduction (W2660) for a Small Business Innovative Research (SBIR) Assessment, a \$136 thousand reduction (W1998) due to a midyear review below threshold reprogramming, a \$31 thousand (W1998) and \$38 (W2660) reduction for inflation savings, a \$2 thousand reduction for reprioritization of requirements within the Navy, a \$143 thousand increase for the CVW5 prototype, and a \$6,000 thousand Congressional add for the Rangeless Training System technical evaluation (executed under W2660). The FY 2000 decrease reflects a \$43 thousand reduction for an Across-the-Board Congressional rescission. The FY 2001 net decrease of \$150 thousand reflects a \$49 thousand reduction for reprioritization of requirements within the Navy, a net decrease of \$41 thousand due to Strategic Sourcing Plan savings and Navy Working Capital Fund (NWCFF) adjustments, a \$64 thousand decrease for revised economic assumptions, and a \$4 thousand increase for Military and Civilian Pay.

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W1998

PROJECT TITLE: Joint Tactical Combat Training  
System (JTCTS)

### CHANGE SUMMARY EXPLANATION CONT.:

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

### (U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
(U) OPN/P-1 Weapons Range Support Equipment	0	0	1,600	4,389	2,885	3,877	2,876	CONT.
(U) APN/P-1 Other Production Charges	0	8,230	13,412	14,530	15,037	15,339	15,686	CONT.

### Related RDT&E

(U) P.E.: Joint program with USAF Program Element 0604735F

(U) C. ACQUISITION STRATEGY: Due to the restructured acquisition program, we plan on maintaining a cost plus award fee (CPAF) contract for the E&MD and Follow-on Test and Evaluation (FOT&E) efforts through each phase of JTCTS development.

(U) D. SCHEDULE PROFILE: See attached milestone chart.

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Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 22 of 35)



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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204571N      PROJECT NUMBER: W1998  
 PROGRAM ELEMENT TITLE: Consolidated Training Systems      PROJECT TITLE: JTCTS

Milestones	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	To Complete
Phases												(Phase III)
Milestones IOC	Δ MS-II				Δ Program Review	Δ Program Review	Δ MS-III				Δ Program Reviews	Δ IOC Fleet Range (LWTC)
Contract Award or	Δ E&MD		Δ PDR (H/W)		Δ LRIP 1	Δ URIP 2	Δ FRP					
Deliveries												
DT&												
OT&												
USN PIP Qty					0	22	56	65	66	76	78	365
USAF PIP Qty				0	0	12+	36	36	75	51	70	700
TOTAL				12	0	34+	92	101	141	127	148	1065
	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	

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EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W1998  
PROJECT TITLE: JTCTS

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
				<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>			
Mobile Rangeless EMD Development	C/CPAF	Raytheon	78,278	3,635	1Q/99	4,284	1Q/00			0	85,577	85,577
Award Fee	C/CPAF	Raytheon	5,714							0	5,714	5,714
Fixed Range EMD Development	C/CPAF	Raytheon	0					4,716	1Q/01	0	4,716	4,716
Award Fee	C/CPAF	Raytheon	0					425	1Q/01	0	425	425
System Engineering (Misc. less than \$1M)	Various	Various	24,863	1,098	1Q/99	1,800	1Q/00	1,450	1Q/01	CONT.	CONT.	
Rangeless Training System												
	C/CPFF	Raytheon	0	1,873	3Q/99					0	1,873	1,873
	C/CPFF	SAIC	0	2,392	3Q/99					0	2,392	2,392
	C/CPFF	Metric Sys Corp	0	588	3Q/99					0	588	588
	Various	Various	0	3,201	3Q/99					0	3,201	
<b>Subtotal Project Development</b>			<b>108,855</b>	<b>12,787</b>		<b>6,084</b>		<b>6,591</b>		<b>CONT.</b>	<b>CONT.</b>	
Remarks Percent of award fee that was actually awarded in prior years is 54% (3.1M).												
Miscellaneous	Various	Various	8,290	1,147	1Q/99	484	1Q/00	886	1Q/01	CONT.	CONT.	
<b>Subtotal Support</b>			<b>8,290</b>	<b>1,147</b>		<b>484</b>		<b>886</b>		<b>CONT.</b>	<b>CONT.</b>	
Remarks												
Miscellaneous	Various	Various	1,361	903	1Q/99	1,260	1Q/00	306	1Q/01	CONT.	CONT.	
<b>Subtotal Test &amp; Evaluation</b>			<b>1,361</b>	<b>903</b>		<b>1,260</b>		<b>306</b>		<b>CONT.</b>	<b>CONT.</b>	
Remarks												
Total Cost			<b>118,506</b>	<b>14,837</b>		<b>7,828</b>		<b>7,783</b>		<b>CONT.</b>	<b>CONT.</b>	

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204571N      PROJECT NUMBER: W2124  
PROGRAM ELEMENT TITLE: Consolidated Training Systems      PROJECT TITLE: Air Warfare Training Development  
(U) COST: (Dollars in Thousands)      Development

Project Number & Title	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
W2124 Air Warfare Training Development	1,780	2,119	2,157	1,918	2,149	2,201	2,246	CONT.	CONT.
TOTAL	1,780	2,119	2,157	1,918	2,149	2,201	2,246	CONT.	CONT.

Quantity of RDT&E Articles: Not Applicable.

### (U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project develops new training system technologies for use in naval aviation training. Products from this effort directly support the Marine Corps Aviation Simulation Master Plan and will support the development and design of future naval aviation training, mission rehearsal systems. Tasks include: 1) Advanced training systems development to provide for transportable, modular, High Level Architecture (HLA) compliant, high fidelity Mission rehearsal capabilities. Mission rehearsal is defined as the practice of planned tasks and functions critical to mission success using a true-to-life, interactive representation of the expected operating environment. Technologies to be developed and integrated include helmet mounted and/or flat panel displays, photographic quality image generation, advanced environmental effects models, radar/infra-red/electro-optic and acoustic sensor simulations; and 2) the Aviation Training Technology Integration Facility (ATTIF) which is a man-in-the-loop test bed for the integration of software, hardware, and networked systems. ATTIF will include a HLA node for participation in the fleet exercise synthetic battle space. This ATTIF capability provides a window to fleet aviators for critical comment, evaluation, and fine tuning of new and innovative technology before it is fielded.

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems  
Development

PROJECT NUMBER: W2124

PROJECT TITLE: Air Warfare Training Development

### (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

#### 1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$474) Developed Image Generator performance specifications for rehearsal, training, and network-able PCs.
- (U) (\$320) Developed baseline night vision device (NVD) simulation performance specifications.
- (U) (\$876) Reached IOC for ATTIF network-able, re-configurable mission rehearsal device.
- (U) (\$110) Determined specification-level database attributes for IR, environmental and special effects modeling.

#### 2. FY 2000 PLAN:

- (U) (\$505) Develop NVD simulation performance specifications for legacy systems integration.
- (U) (\$282) Demonstrate/evaluate combat special effects modeling (ATTIF).
- (U) (\$120) Develop draft performance specifications for combat special effects modeling.
- (U) (\$624) Demonstrate low-cost, network-able, PC-based IGs with photo-realistic databases (ATTIF).
- (U) (\$588) Develop initial performance specifications for modular weapons systems simulation.

#### 3. FY 2001 PLAN:

- (U) (\$403) Demonstrate/evaluate re-configurable mission rehearsal devices (ATTIF).
- (U) (\$ 94) Develop performance specifications for re-configurable mission rehearsal devices.
- (U) (\$441) Achieve IOC for BFTT, JTIDS, JTIDS, JTCIS integration to ATTIF.
- (U) (\$619) Develop initial performance specification for fused cockpit imagery.
- (U) (\$600) Develop initial performance specification for advanced IG to human systems integration.

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

PROJECT NUMBER: W2124

PROJECT TITLE: Air Warfare Training Development

### (U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	1,847	2,131	2,192
(U) Appropriated Value:	2,053	2,131	
(U) Adjustments from President's Budget:	-67	-12	-35
(U) FY 2001 President's Budget Submit:	1,780	2,119	2,157

### CHANGE SUMMARY EXPLANATION:

(U) Funding: FY1999 reflects a \$7 thousand decrease for Small Business Innovative Research assessment, a \$51 thousand decrease for reprioritization of requirements within the Navy, and a \$9 thousand decrease for revised economic assumption. FY2000 reflects a \$12 thousand decrease for an Across the Board Congressional Rescission. FY2001 reflects a net decrease of \$4 thousand due to Strategic Sourcing Plan savings and Navy Working Capital Fund (NWCFF) adjustments offset by a \$1 thousand increase for Military and Civilian Pay, a \$18 thousand decrease for economic assumptions, and a \$14 thousand decrease for reprioritization of requirements within the Navy.

(U) Schedule: N/A

(U) Technical: N/A

### (U) C. OTHER PROGRAM FUNDING SUMMARY

<u>Appn</u>	<u>FY 1999</u> <u>Actual</u>	<u>FY 2000</u> <u>Budget</u>	<u>FY 2001</u> <u>Estimate</u>	<u>FY 2002</u> <u>Estimate</u>	<u>FY 2003</u> <u>Estimate</u>	<u>FY 2004</u> <u>Estimate</u>	<u>FY 2005</u> <u>Estimate</u>	<u>To</u> <u>Complete</u>
APN Line 9 BA-1 (U1AV) UH-1Y/AH-1Z (4BN/4BW)		0	0	42,777	0	8,810	0	51,587
APN Line 51 BA-7 (47C2) Common Ground	0	20,370	10,592	0	22,647	0	0	53,609
<b>Equipment (USMC Aviation Simulation Master Plan)</b>								

### Related RDT&E

(U) P.E. 0603707N, Project #R1773, Sub-Project Title: Transportable Strike Assault Rehearsal System (T-STARS)

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems Development

PROJECT NUMBER: W2124

PROJECT TITLE: Air Warfare Training Development

### (U) D. ACQUISITION STRATEGY:

This is a non-acquisition program with no specific acquisition strategies.

### (U) E. SCHEDULE PROFILE:

#### (U) Program Milestones:

<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>To Complete</u>
*1Q/00	NAPDD	1Q/03	NAPDD
	Implement		Implement
	Integration Plan		Integration Plan

#### (U) Engineering Milestones:

3Q/99 PC IG Sensor Sim	2Q/00 PC IG Perf Spec	3Q/01 Re-config MR devices
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#### (U) T&E Milestones:

4Q/99 IOC ATTIF network PC IG demo	3Q/00 PC IG photo-realistic Db	4Q/01 Re-config MR device demo	4Q/01 IOC for BTFF, JTIDS, JCTCS integ to ATTIF
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#### (U) Contract Milestones

\* Non-Acquisition Program Definition Document for Air Warfare Training Development.

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## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: Feb 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: W2124

PROJECT TITLE: Air Warfare Training Development

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
Developmental Misc. (Misc less than \$1M)	MPIR/WX	Miscellaneous	7,186	834	11/98	1,247	11/99	1,274	11/00	CONT.	CONT.	CONT.
<b>Subtotal Product Development</b>			<b>7,186</b>	<b>834</b>		<b>1,247</b>		<b>1,274</b>		<b>CONT.</b>	<b>CONT.</b>	<b>CONT.</b>
Engineering and Technical Support	RC	Gen Physics	749	100	11/98	110	11/99	110	11/00	CONT.	CONT.	CONT.
<b>Subtotal Support</b>			<b>749</b>	<b>100</b>		<b>110</b>		<b>110</b>		<b>CONT.</b>	<b>CONT.</b>	<b>CONT.</b>
Developmental (Misc. less than \$1M)	WX	Misc/ATTIF	1,154	815	11/98	731	11/99	742	11/00	CONT.	CONT.	CONT.
<b>Subtotal Test &amp; Evaluation</b>			<b>1,154</b>	<b>815</b>		<b>731</b>		<b>742</b>		<b>CONT.</b>	<b>CONT.</b>	<b>CONT.</b>
Travel	WX	NAWC-AD	710	31	11/98	31	11/99	31	11/00	CONT.	CONT.	CONT.
<b>Subtotal Management</b>			<b>710</b>	<b>31</b>		<b>31</b>		<b>31</b>		<b>CONT.</b>	<b>CONT.</b>	<b>CONT.</b>
<b>Total Cost</b>			<b>9,799</b>	<b>1,780</b>		<b>2,119</b>		<b>2,157</b>		<b>CONT.</b>	<b>CONT.</b>	<b>CONT.</b>

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: FEB 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0204571N      PROJECT NUMBER: X1823  
 PROGRAM ELEMENT TITLE: Consolidated Training Systems      PROJECT TITLE: Training and Modeling Systems (TMS)

### Development

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1999 ACTUAL	FY 2000 BUDGET	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM

### X1823 Training and Modeling Systems (TMS)

9,783	8,177	9,579	9,077	8,631	7,457	7,636			CONT
									CONT

A (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The employment of naval forces in a multi-dimensional warfare environment is a complex operational problem. To counter the threat expected in hostile environments, naval officer training must be provided for all mission areas on a real-time basis at the Battle Force/Group level. This training must focus on tactical decision-making, tactics development/evaluation, and operational planning/execution. Shore-based classroom training and at-sea exercises have historically satisfied the Battle Group tactical training requirement. However, the effectiveness of this approach to training was reduced by the lack of a real-time decision-making environment during shore-based training and the reduction in number and scope of at-sea exercises. This requirement is fulfilled by the Joint Simulation System (JSIMS), which will replace the Enhanced Naval Warfare Gaming System (ENWGS), a legacy modeling and simulation training system.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Joint Simulation System (JSIMS) will replace ENWGS and provide expanded functionality. The mission of JSIMS is to provide a readily available, operationally valid synthetic environment for the Commanders-in-Chief (CINCs), their components, other Joint organizations and the Services to: jointly train, educate, develop doctrine and tactics, formulate and assess operational plans, assess warfighting situations, define operational requirements, and provide operational inputs to the acquisition process. In short, JSIMS will provide not only an improved certified capability for inter-Service operability but also an enhanced Joint Battle Staff training capability for the warfighting CINCs. All service Executive Agents (EAs) and Development Agents (DAs) are required to contribute to the initial population of the JSIMS architecture with facilities, services and tools, to meet an Initial Operational Capability (IOC) for Joint Task Force (JTF) training of no later than March 2002. In keeping with the premise that the Services/components are best able to define their own capabilities and functionality, the JPO is working in concert with the Services to import Service-provided functionality such as land, air, naval and littoral warfare to JSIMS. The JPO will integrate these functionalities for use by Joint Army/Marine/Navy/Air Force exercise. JSIMS development is incremental. In June 1994 the Services and Director Joint

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Exhibit R-2a, RDT&E Project Justification  
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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems  
Development

PROJECT NUMBER: X1823

PROJECT TITLE: Training and Modeling Systems (TMS)

Program Office signed a Memorandum Of Agreement (MOA) to establish JSIMS; a critical next-generation Modeling and Simulation (M&S) system. The long term goal of the agreement is to integrate the range of missions of the Armed Forces within a common framework. That framework provides a balanced melding of live, virtual and constructive M&S representations, with Command, Control, Communications, Computers and Intelligence (C4I) fully supported, and interfaces using real-world equipment. As the Maritime Warfare EA, OPNAV N7, on 29 Aug 1995, assigned NAVSEA as the JSIMS Maritime Development Agent (DA). The objective of the JSIMS Maritime portion of the JSIMS Program is to train at all levels of command, in all warfare areas, including joint and service specific training. JSIMS Maritime is developing the Maritime Mission Space Objects for the JSIMS Program, as well as selected portions of the core infrastructure and services to be determined when the Joint Object Model is partitioned. PROGRAM WAS TRANSFERRED FROM NAVSEA TO SPAWAR IN FY99.

### 1. (U) FY 1999 ACCOMPLISHMENTS:

- (\$9,783) - Completed Build N1 Engineering & Development and T&E; completed Build N2 Engineering & Development. Began Engineering & Development on Build N3; accomplished work on Domain Design, Domain Analysis, and Software Construction. Initiated Database Development and Integration and Test. Initiated Software Version 1.1 Development. Developed JSIMS enterprise security architecture; Conducted Engineering & Development of C4I system interfaces; Implemented High Level Design architecture for all software models; conducted Verification & Validation of Build N1, N2, and N3 software models.

### 2. (U) FY 2000 PLAN:

- (\$4,498) - Complete Build N3, which includes all the models and functionality required to fully meet the JSIMS ORD for IOC and conduct demonstration of functionality.
- (\$1,495) - Conduct Database Development, Software Construction, and Integration and Test. Continue work on Software Version 1.1.
- (\$2,184) - Complete security Engineering & Development for Build N2 Collaborative Event. Conduct Build N2 and N3 Collaborative Events in preparation for FY 2002 IOC.

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Exhibit R-2a, RDT&E Project Justification  
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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems  
Development

PROJECT NUMBER: X1823

PROJECT TITLE: Training and Modeling Systems (TMS)

3. (U) FY 2001 PLAN:

- (\$2,157) - Complete post-Collaborative Event Development, Integration, and Testing.
- (\$3,190) - Complete security development for IOC exercise; Develop and Conduct IOC exercise.
- (\$4,232) - Continue Engineering & Development of Version 1.1 for release to Navy training sites. Begin Engineering & Development of Software Version 1.2.

B. (U) PROGRAM CHANGE SUMMARY: FY-99 : Additional JSIMS Development (+\$1,855K); Revised Economic Assumptions (-\$19K); Civilian Personnel Underexecution (-\$14K); FY-99 SBIR/STT Transfer (-\$98K); BTR 99-49, LOCO GYSI Reprogramming (-\$70K); Inflation Savings (-\$37K); FY-99 BTRs (-\$1K); FY-00: Across-the-Board Reduction (-\$37K); Across-the-Board Rescission Bal (-\$9K); FY-01: JSIMS Realignment(-\$1,000K); SSP (Contracts) (-\$9K); NWCf Rates-NCCOSC (-\$32K); SSC A76 (-\$3K); NWCf Rates-Naval Surface (+\$1K); Fix project for Outsourcing ADJ (+\$131K); PBD411: ICC 0611 (NSWC) (+1K); PBD411: ICC 0614 (SPAWAR) (+\$12K); PBD-606: Mil/Civ Pay Rates - SPAWAR (+\$5K); PBD604: Nonpay Pur Inflation (-\$67K); PBD022C2: Active Navy Ops (-\$25K).

C. (U) OTHER PROGRAM FUNDING SUMMARY; (Dollars in thousands)

OPN (TTDS)	FY99	FY00	FY01
O&MN (TTDS)	1,019	0	0
OPN (TMS)	1,555	1,881	2,565
O&MN (TMS)	0	1,005	1,341
	0	236	2,159

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROGRAM ELEMENT TITLE: Consolidated Training Systems  
Development

PROJECT NUMBER: X1823

PROJECT TITLE: Training and Modeling Systems (TMS)

(U) SCHEDULE PROFILE:

FY 1999

FY 2000

FY 2001

( U ) Program Milestones

( U ) Engineering Milestones

3Q Build 1 (B1) Core Infra-  
Structure (CI)  
Test Harness, URP Wkstn

2Q Build 2 CI  
2Q Build 3 CI

2Q Build 3 Delivery

( U ) T&E Milestones

4Q SERRT Demo  
(Build 1 Core IS)

3Q B2 Integ/Test  
Collaborative Event

2Q B3 Integ/Test  
Collaborative Event  
2Q Full System Test

(U ) Contract Milestones: N/A

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Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 33 of 35)

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: X1823

PROJECT TITLE: Training and Modeling Systems (TMS)

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYS Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development												
Ancillary Hardware Development												
Systems Engineering	WR/RCP	Various	2,035	1,251	11/98	1,205	11/99	1,457	11/00	CONT	CONT	N/A
Licenses	WR/RCP	SSCSD, CA		408	11/98	412	11/99	480	11/00	CONT	CONT	N/A
Tooling												
GFE												
Award Fees												
Subtotal Product Development			2,035	1,659		1,617		1,937		CONT	CONT	N/A

Remarks:

\* PY Total also includes Multiple Contractors under Performing Activity

Development Support Equipment												
Software Development	WR/RCP	SSCSD, CA	9,964	2,927	11/98	2,092	11/99	2,346	11/99	CONT	CONT	N/A
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data	WR/RCP	SSCSD, CA*		2,318	11/98	1,606	11/99	1,904		CONT	CONT	N/A
GFE												
Subtotal Support			9,964	5,245		3,698		4,250		CONT	CONT	N/A

Remarks:

\*PY includes Multiple Contractors under Performing Activity

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Exhibit R-3, RDT&E Cost Analysis  
(Exhibit R-3, Page 34 of 35)

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## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204571N

PROJECT NUMBER: X1823

PROJECT TITLE: Training and Modeling Systems (TMS)

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR/RCP	Various	1,620	397	11/98	412	11/99	480	11/00	CONT	CONT	N/A
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			1,620	397		412		480		CONT	CONT	N/A
Remarks:												
*PY includes NSWC PHD under Performing Activity												
Contractor Engineering Support	WR/RCP	SSCSD, CA		1,250	11/98	1,207	11/99	1,351	11/00	CONT	CONT	N/A
Government Engineering Support	WR/RCP	SSCSD, CA		1,192	11/98	1,168	11/99	1,474	11/00	CONT	CONT	N/A
Program Management Support												
Program Management Personnel												
Travel	WR/RCP	SSCSD, CA		40	11/98	75	11/99	87	11/00	CONT	CONT	N/A
Labor (Research Personnel)												
Overhead												
Subtotal Management				2,482		2,450		2,912		CONT	CONT	N/A
Remarks:												
* PY includes Multiple Contractors under Performing Activity												
TOTAL COST			13,619	9,783		8,177		9,579		CONT	CONT	N/A
Remarks:												

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Exhibit R-3, RDT&E Cost Analysis  
(Exhibit R-3, Page 35 of 35)

Exhibit R-2, RDT&E Budget Item Justification												Date: Feb 00
APPROPRIATION/BUDGET ACTIVITY : RDT&E,N/ 7												
R-1 ITEM NOMENCLATURE												
ELECTRONIC WARFARE READINESS SUPPORT 0204575N												
COST (\$ in Millions)	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	Cost to Complete	Total Cost		
Z2263 Information Warfare	1.574	4.440	3.475	4.455	5.346	5.627	6.308	6.403	CONT.	CONT.		
Z2462 Retract Barley	0	0	5.637	5.469	5.070	5.162	5.262	5.365	CONT.	CONT.		
Total	1.574	4.440	9.112	9.924	10.416	10.789	11.570	11.768	CONT	CONT		
A. Mission Description and Budget Item Justification :												
The Naval Information Warfare Activity (NIWA) serves as the Program Manager for the OFFENSIVE IW program. As such NIWA is tasked as the Navy's principal technical agent to research, assess, develop and prototype Information Warfare (IW) capabilities. A key focus is providing tactical commanders with both an IW Mission Planning, Analysis, and Command and Control Targeting System (IMPACTS) tool and state-of-the-art Electronic Attack hardware and software. The program initiated the design of next generation tactical deception (TD) systems as well as designed the next generation psychological operations (PSYOP) system. This will continue through FY01. FY01 will initiate design to modify and incorporate second generation jammer to the USQ-146. This project will continue upgrades through out-years. Ongoing efforts are to identify and develop new IW tools.												
B. Program Change Summary: Special program adjustment is to fund a program held under higher classification.												
COST (\$ in Millions)	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05				
1/99 FY99 President's Budget	1.574	3.716	9.162	9.316	4.903	5.555	8.041	8.414				
POM Adjustment				.717	1.577	1.797	2.416	2.258				
Revised Econ Assumptions		-0.009										
Special Program				4.059	-0.010	3.567	1.272	1.269				
Various Rate Adjustments				-0.007	-0.016	-0.011	-0.016	-0.016				
Program Adjustments		0.750										
Across the board/Inflation Adj		-0.017	-0.050	-0.102	-0.113	-0.119	-0.143	-0.157				
9/99 Total Funding	1.574	4.440	9.112	9.924	10.416	10.789	11.570	11.768				
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Exhibit R-2a, RDT&E Project Justification										Date: Feb 00
RDT&E.N	BA-7	0204575N INFORMATION WARFARE Z2263								
Cost (\$ in Millions)	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	Cost to Complete	Total Cost
Project Cost	1.574	4.440	3.475	4.453	5.347	5.629	6.312	6.408	CONT.	CONT.
RDT&E Articles Qty	VAR	VAR	VAR	TBD	TBD	TBD	TBD	TBD	CONT.	CONT.
A. Mission Description and Budget Item Justification										
FY 1998 Accomplishments										
(0.274) IMPACTS Updates										
(0.300) PSYOP/Tactical Deception										
(1.000) Electronic Attack										
FY 1999 Accomplishments										
(1.601) IMPACTS Updates										
(1.161) PSYOP/Tactical Deception										
(1.678) Electronic Attack										
FY 2000 Plan										
(1.675) IMPACTS Updates										
(0.600) PSYOP/Tactical Deception										
(1.200) Electronic Attack										
FY 2001 Plan										
(2.108) IMPACTS Updates										
(0.600) PSYOP Tactical Deception										
(1.745) Electronic Attack										
B. Other Program Funding Summary										
	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	ToTotal Complete	Cost
OMN Line 4B7N	1.694	3.402	1.832	1.989	2.341	2.439	2.535	2.735	CONT.	CONT.
OPN 23400/6	3.639	3.912	4.098	3.901	2.549	2.848	3.353	3.470	CONT.	CONT.
C. Acquisition Strategy: This is a non-ACAT program.										

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Exhibit R-2a, RDT&E Project Justification

Date: Feb 00

D. Schedule Profile: IMPACTS updates transitioned the deploying CV and ARG shipboard SI Storage systems from 24 Gbyte fixed disk storage to 105 Gbyte RAID configuration storage systems. Provide software (RFMP and CM+) in new, GCSS-3 operating system format and supports laboratory and shipboard tests of same. Initiated transition to PC based software in addition to current, UNIX based GUI. The software will be delivered in April 2000 as part of initial SPAWAR test of GCCS-M version 4.0.

PSYOP/Tactical Deception completed the Shipalt for the Transportable AM/FM Radio Broadcast System (TARBS) in support of FIWC PSYOP Operations. Field testing of the TARBS system and the purchase of spares kit has been completed. Tactical Deception as initiated modification of the NIWA/NRL software suite to provide visual evaluation of the impact of TD plans on an enemy's ability to detect ship movements.

Electronic Attack has initiated design of HF modification to AN/USQ-146 and changed the format to VME configuration. This is an ongoing process. In FY99 there was a procurement of three AN/USQ-146 units and associated spares. Also completed was four pre-grooms of ships with two of them forward deployed in the Korean theater. The Navy's Fallon air range has been updated to address integrated air defenses in an IW environment. The program has also provided carry-on ESM system for deploying battle groups.

Cost (\$ in Millions)	FY99	FY00	FY01	FY02	FY03	FY04	FY05
IMPACTS	1.601	1.675	2.108	2.797	3.029	3.412	3.508
PSYOPS/TD	1.161	0.600	0.600	0.900	0.900	1.100	1.100
Electronic Attack	1.678	1.200	1.745	1.650	1.700	1.800	1.800

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Exhibit R-2a, RDT&E Project Justification										Date: Feb 00
RDT&E,N BA-7	RETRACT BARLEY Z2462									
Cost (\$ in Millions)	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	Cost to Complete	Total Cost
Project Cost	0	0	5.637	5.469	5.070	5.162	5.262	5.365	CONT.	CONT.
RDT&E Articles Qty										
A. Mission Description and Budget Item Justification										
RETRACT BARLEY details held at a higher classification level.										
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Exhibit R-3 Cost Analysis										Date: Feb 00	
RDT&E,N/7										INFORMATION WARFARE/Z2263	
Program Element0204575N											
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	Var	Var	0	0.100 Var	0		0		0	0.100	
Subtotal T&E				0.100 Var						0.100	
Remarks											
AIS Support	Var	Var	0	0.114 Var	0	0	0	0	0.114	0.114	
Government Engineering Support	Var	Var	0	0	0.200	Var	0.245	Var	Cont	Cont	
Program Management Support	Var	Var	0	0	0.125	Var	0.150	Var	Cont	Cont	
Subtotal Management			0	0.114 Var	0.325	Var	0.395	Var	Cont	Cont	
Remarks											
Total Cost			1.574	4.440 Var	3.475	Var	4.453	Var	Cont	Cont	
Remarks											

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## EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROGRAM ELEMENT TITLE: HARM Improvement

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
E1780 HARM Improvement	6,999	11,260	9,469	5,057	3,920	2,094	2,168	0	51,256
E2185 Advanced Anti-Radiation Guided Missile (AARGM)	20,485*	25,700**	8,979	0	0	0	0	0	120,597***
E2211 Joint Advanced Weapons System (JAWS) (Army Lead)	927	1,467	2,907	3,819	3,778	3,744	3,737	0	23,137
<b>TOTAL</b>	<b>28,411</b>	<b>38,427</b>	<b>21,355</b>	<b>8,876</b>	<b>7,698</b>	<b>5,838</b>	<b>5,905</b>	<b>0</b>	<b>194,988</b>

\* The FY99 budget reflects a \$12.0M Congressional Add for AARGM (W2661/E2661), which has been decreased by \$378K for Congressional undistributed adjustments.

\*\* The FY00 budget reflects a \$15M Congressional Add for AARGM (E2185), which has been decreased by \$60K for Congressional undistributed adjustments.

\*\*\* Funding prior to FY97 for this project is under PE 0603217N. E1780, E2185,E2211 were previously executed under W1780, W2185, W2211 respectively.

### (U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) E1780/HIGH-SPEED ANTI-RADIATION (HARM) IMPROVEMENT: The HARM Improvement Program consists of two improvement efforts: a tactical software upgrade (Block V) to the missile and the International HARM Upgrade Program (IHUP) (Block VI). Block VI is a tri-national Precision Navigation Unit (PNU) cooperative program consisting of a USN-unique tactical software upgrade and a hardware upgrade which includes an Inertial Measurement Unit (IMU) and a Global Positioning System (GPS) receiver. This will provide a much improved guidance capability for the current AGM-88B missile (in German and Italian inventories) and AGM-88C missile (in U.S. inventory). This IMU/GPS system will be retrofitted into existing missiles, as a kit, at the depot.

(U) E2185/ADVANCED ANTI-RADIATION GUIDED MISSILE (AARGM) and W2661/AARGM (Congressional Add): AARGM is a Phase III Small Business Innovative Research (SBIR) program designed to demonstrate an advanced dual-mode seeker on an existing High speed Anti-Radiation Missile (HARM) airframe. For ease of tracking, Project Unit W2661 is included in the E2185 funding profile.

(U) E2211/JOINT ADVANCED WEAPONS SYSTEM (JAWS): JAWS is a proposed joint service program to support Army and USMC Mission Need Statements for multi-role follow-on weapons to the TOW and Hellfire missiles. The DON is participating with the Army in joint trade studies, Analysis of Alternatives, and the development of Milestone 0 support documentation.

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Exhibit R-2, RDT&E Budget Project Justification  
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**EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**  
**PROGRAM ELEMENT: 0205601N**  
**PROGRAM ELEMENT TITLE: HARM Improvement**

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0205601N**      **PROJECT NUMBER: E1780**  
**PROGRAM ELEMENT TITLE: HARM Improvement**      **PROJECT TITLE: HARM Improvement**

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999</u> <u>Actual</u>	<u>FY 2000</u> <u>Budget</u>	<u>FY 2001</u> <u>Estimate</u>	<u>FY 2002</u> <u>Estimate</u>	<u>FY 2003</u> <u>Estimate</u>	<u>FY 2004</u> <u>Estimate</u>	<u>FY 2005</u> <u>Estimate</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
E1780 HARM Improvement	6,999	11,260	9,469	5,057	3,920	2,094	2,168	0	51,256
<b>TOTAL</b>	<b>6,999</b>	<b>11,260</b>	<b>9,469</b>	<b>5,057</b>	<b>3,920</b>	<b>2,094</b>	<b>2,168</b>	<b>0</b>	<b>51,256</b>

Quantity of RDT&E Articles: N/A

**(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:**

The High-speed Anti-Radiation Missile (HARM) is a joint service program with the Air Force (NAVY lead). The program has been in full production since FY 1983. Program Element 0205601N was used until FY 1990 to develop and test one hardware and two software upgrades to the HARM as Engineering Change Proposals (ECPs). Another ECP software program (Block V) was recently developed (FY96 through FY99) to modify HARM software in order to meet operational requirements. This joint service upgrade was developed with Air Force funds under Raytheon Missile Systems Company Contract N0001993G0179. The Air Force funded all contractor development and contractor Test and Evaluation (T&E) cost. The Navy funded all government costs related to development and T&E. The tactical software upgrade will give HARM a Home-On-Jam (HOJ) capability, improved geographic specificity, and improved capability against advanced waveforms. Studies to address corrective actions for documented deficiencies will be conducted. A portion of the HARM inventory is being reprogrammed with Block V software this year. Project is expected to terminate in FY00 when Block V software is distributed to the Fleet.

The International HARM Upgrade Program is a tri-national (U.S., Italy, and Germany) cooperative program designed to improve the HARM's effectiveness by enhancing the missile's probability of kill and reducing the potential for fratricide while making the missile easier to employ. The Program consists of significant hardware and software modifications to the missile's control and guidance sections. The USN frequently refers to the IHUP upgrade as Block VI. The three nations involved have agreed to jointly fund the design, development, testing and production of hardware kits to be installed in the missile control section along with an improved software version to be installed in the missile guidance section.

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### EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROJECT NUMBER: E1780

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT TITLE: HARM Improvements

#### ( U ) PROGRAM ACCOMPLISHMENTS AND PLANS:

##### 1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$1788) Completed the NAWCWD China Lake Block V joint service support of the combined DT/OT program. Completed government development of ELINT, TAMPS, and avionics updates required for the Block V Upgrade. Conducted the Functional Configuration Audit/Physical Configuration Audit and development of the Engineering Change Proposal to incorporate the Block V software into the HARM inventory.
- (U) (\$ 822) Provided HARM Block V system engineering support of development and systems integration efforts. Continued weapon system upgrade studies assessing weapons service life, missile performance, deficiencies, and logistics requirements.
- (U) (\$326) Provided logistic support by Government personnel of Block V Software Upgrade to HARM missiles at field sites.
- (U) (\$14) Continued Contractor Engineering and Project Management Services in support of the HARM Upgrade Program (Block VI) contract.
- (U) (\$500) Initiated Contractor development of Block VI USN unique software subroutines. Initiated design/development of Inertial Measurement sub-systems and development of hardware and software associated with Block VI.
- (U) (\$1,205) Continued Contractor Engineering and Project Management Services in support of the HARM Upgrade Program (Block VI) contract.
- (U) (\$36) Continued Government Project Management Services in support of HARM (Block V) Program.
- (U) (\$50) Continued Government Project Management Services in support of HARM (Block VI) Program
- (U) (\$551) Continued Government engineering support of the HARM Upgrade Program (Block VI) including preparation for a Preliminary Design Review; support for the Interface Control Working group in defining interface requirements; supporting contractor sub-system design, analysis and testing.
- (U) (\$15) Continued Government support of contractor testing including evaluation of test plans, reports, and preparation of detailed test planning documentation.
- (U) (\$142) Initiated Government logistic support including logistics support analyses and evaluating contractor designs for Block VI.

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### EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

#### BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: E1780

PROJECT TITLE: HARM Improvements

- (U) (\$1,550) Continued Government and contractor participation in developing the aircraft avionics updates required by the HARM Upgrade Program (Block VI) in addition to CLC/TAMPS upgrade efforts and ELINT development.
- 2. FY 2000 PLAN:
  - (U) (\$5,624) Continue design/development of Inertial Measurement sub-systems and development of hardware and software associated with Block VI. Continue development of Block VI USN unique software sub-routines.
  - (U) (\$354) Continue Engineering and Project Management Services in support of the HARM Upgrade Program (Block VI) contract.
  - (U) (\$891) Continue Government engineering support of the HARM Upgrade Program (Block VI) including preparation for Critical Design Review of Block VI software/hardware design. Effort includes further engineering studies, threat analysis, 6 Degrees of Freedom (DOF) analysis, documentation analysis, interface definition, precision navigation engineering, and software quality evaluation.
  - (U) (\$137) Continue Government support of contractor testing including evaluation of test plans, reports, and preparation of detailed test planning documentation, and captive flight testing.
  - (U) (\$271) Continue Government logistic support including logistics support analyses, maintenance engineering, support equipment engineering, and evaluating contractor designs.
  - (U) (\$3,983) Continue Government and contractor participation in integration efforts. Continue developing the aircraft avionics updates required by the HARM Upgrade Program (Block VI) in addition to Command Launch Computer (CLC)/TAMPS upgrade efforts and ELINT development. Develop HARM TAMPS/Mission Planning Module (MPM) rehost.

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Exhibit R-2a, RDT&E Budget Project Justification  
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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: E1780

PROJECT TITLE: HARM Improvements

3. FY 2001 PLAN:

- (U) (\$4,908) Continue design/development of Inertial Measurement sub-systems and development of hardware and software associated with Block VI. Continue development of Block VI USN unique software sub-routines.
- (U) (\$400) Continue Engineering and Project Management Services in support of the HARM Upgrade Program (Block VI) contract.
- (U) (\$1,343) Continue Government engineering support of the HARM Upgrade Program (Block VI) including preparation for Critical Design Review of Block VI software/hardware design. Effort includes further engineering studies, threat analysis, 6 Degrees of Freedom (DOF) analysis, documentation analysis, interface definition, precision navigation engineering, and software quality evaluation.
- (U) (\$145) Continue Government support of contractor testing including evaluation of test plans, reports, and preparation of detailed test planning documentation, and captive flight testing.
- (U) (\$222) Continue Government logistic support including logistics support analyses, maintenance engineering, support equipment engineering, and evaluating contractor designs.
- (U) (\$2,451) Continue Government and contractor participation in integration efforts. Continue developing the aircraft avionics updates required by the HARM Upgrade Program (Block VI) in addition to Command Launch Computer (CLC)/TAMPS upgrade efforts and ELINT development. Develop HARM TAMPS/Mission Planning Module (MPM) rehost.

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROJECT NUMBER: E1780

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT TITLE: HARM Improvements

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	7,148	11,323	9,577
(U) Appropriated Value:	7,448	11,323	0
(U) Adjustments from Pres Budget:	-149	-63	-108
(U) FY 2001 President's Budget Submit:	6,999	11,260	9,469

CHANGE SUMMARY EXPLANATION:

(U) Funding:

The FY 1999 decrease of \$149 thousand reflects a \$33 thousand reduction for the SBIR assessment, a \$79 thousand reduction for the Smart Work/TOC initiative, and a \$37 thousand reduction for inflation savings.

The FY 2000 decrease reflects a \$63 thousand reduction for an Across-the-Board Congressional rescission.

The FY 2001 decrease of \$108 thousand reflects a \$5 thousand reduction for Strategic Sourcing Plan savings, a \$78 thousand decrease for revised economic assumptions, and a \$25 thousand decrease for prioritization of requirements within the Navy.

(U) Schedule: All dates occur one quarter (1Q) later than previously reported due to recognition that HARM International Upgrade Program operates on a calendar year. Dates currently reflect planned milestone by fiscal year.

(U) Technical: No changes

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROJECT NUMBER: E1780

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT TITLE: HARM Improvements

(U) C. OTHER PROGRAM FUNDING SUMMARY

<u>Appn</u>	<u>FY 1999</u> <u>Actual</u>	<u>FY 2000</u> <u>Budget</u>	<u>FY 2001</u> <u>Estimate</u>	<u>FY 2002</u> <u>Estimate</u>	<u>FY 2003</u> <u>Estimate</u>	<u>FY 2004</u> <u>Estimate</u>	<u>FY 2005</u> <u>Estimate</u>	<u>To</u> <u>Complete</u>
WPN HARM MODS	0	89,300	0	0	10,518	10,769	10,955	16,570

Related RDT&E Not Applicable

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205601N      PROJECT NUMBER: E1780  
 PROGRAM ELEMENT TITLE: HARM Improvement      PROJECT TITLE: HARM Improvements

### (U) D. ACQUISITION STRATEGY:

The HARM Block VI Upgrade program is an ACAT III Program and will consist of three separate phases (EMD, Production, and Technology Evaluation and Assessment). The acquisition strategy for the HARM Block VI Program is complete and is based upon a signed international Memorandum of Agreement with Germany, Italy, and the U.S. Navy; a tri-national Cooperative Operational Requirements Document (CORD) details German, Italian, and U.S. Navy common requirements; and a Cooperative Test and Evaluation Master Plan (CTEMP) summarizes all test requirements. These three documents drive the overall acquisition approach to the HARM Block VI project.

Management of the Block VI upgrade will be directed by a trilateral Steering Committee, however, the U.S. Navy Project Manager (in concert with Project Managers from Germany and Italy) is responsible for Program execution. Each partner will share one-third of "common costs," the U.S. Navy will fund Block VI unique costs, and the German and Italian participants will fund Block IIIB unique costs. Each country will pay its own aircraft integration costs.

The acquisition strategy delineates Industry and Government responsibilities. The contract strategy (i.e. hardware and software for missile, upgraded missile sections, contractor team responsibility for missile performance) assigns unique work tasks to each firm. Contract strategy is to issue contracts to Bodenseewerk Geratetechnik GmbH (BGT) (German), Alenia Difesa (Italian), and Raytheon Texas Instruments Systems (RTIS) (U.S.) firms and will maximize use of commercial-off-the-shelf (COTS)/government-off-the-shelf (GOTS)/non-development items (NDI). Each Phase I (EMD) contract type and structure is tailored to the product of each firm.

### (U) E. SCHEDULE PROFILE

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>To Complete</u>
(U) Program Milestones	M/S II (2Q/99)			
(U) Engineering Milestones		PDR (1Q/00)	CDR(1Q/01) TRR(4Q/01)	
(U) T&E Milestones			Combined DT/OT (Start 4Q/01)	Combined DT/OT (End 2Q/02)
(U) Contract Milestones	RTIS, BGT & ALENIA (1Q/99)*			

\* BGT and ALENIA Contracts are not funded with U.S. funds, but are significant milestones in the Block VI contract schedule.

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## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

### BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N  
PE TITLE: HARM Improvement

PROJECT NUMBER: E1780  
PROJECT TITLE: HARM Improvements

<u>Cost Categories:</u> Product Development	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date		
Block IIIA/V Development	WX	NAWC WD, China Lake SPAWAR,	5961	1788	Oct 98	0	N/A	0	N/A	7749	
Block IIIA/V Development	WX	San Diego, CA	125	326	Sep 98	0	N/A	0	N/A	451	
Block VI Development	CPIF	RSC, Tucson AZ BGT, Germany Alenia, Italy	0	500	Sep 99	5624	Jan 00	4908	Jan 01	14407	14,407
Block VI Eng Analyses	FFP	RTIS, Texas	240	0	N/A	0	N/A	0	N/A	240	240
Block VI Development	WX	NAWC WD, China Lake	1099	551	Oct 98	891	Oct 99	1343	Oct 00	5409	
Block VII LS	WX	NAWC WD, Point Mugu	0	142	Oct 98	271	Oct 99	222	Oct 00	1425	
<b>Subtotal Product Development</b>			<b>7425</b>	<b>3307</b>		<b>6786</b>		<b>6473</b>		<b>29681</b>	<b>14,647</b>

Remarks: NONE

### Support

HARM Technical/Integration Studies

WX NAWC WD, China Lake

0 0 110

### Subtotal Support

110 0

0 0 110

Remarks: NONE

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

## BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N  
PE Title: HARM Improvement

PROJECT NUMBER: E1780  
PROJECT TITLE: HARM IMPROVEMENT

Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
			Cost	Date	Cost	Date	Cost	Date				
WX	NAWC WD, China Lake	1524	822	Oct 98	0	N/A	0	N/A		0	2346	
WX	NAWC WD, China Lake	24	1565	Oct 98	4120	Oct 99	2596	Oct 00		6567	14872	
Subtotal Test & Evaluation		1548	2387		4120		2596			6567	17218	
Remarks: NONE												
Management												
Block IIIA/V TRAVEL	NAWC AD, Patuxent MD	149	36	Oct 98	0						185	
Block VI TRAVEL	NAWC AD, Patuxent MD	30	50	Oct 98	24	Oct 99	45	Oct 00		75	224	
Block IIIA/V Tech Assessm't/Mgmt Supp.	NSM, Alex VA	0	14	Mar 99	0		0			0	14	14
Block VI Tech. Assessm'ts/Mgmt Support	DCS, Alex VA	1027	1205	Dec 98	330	Dec 99	355	Dec 00		907	3824	3824

## Subtotal Management

1206 1305 354 400 982 4247 3838

## Remarks: NONE

## Total Cost

10289 6999 11260 9469 13239 51256 18485

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: E2185

PROJECT TITLE: Advanced Anti-Radiation Guided Missile(AARGM)

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
E2185 Advanced Anti-Radiation Guided Missile (AARGM)	20,485**	25,700***	8,979	0	0	0	0	0	120,597*

\* Funding prior to FY97 for this project is under PE 0603217N

\*\* FY99 budget reflects a \$12.0M Congressional add for AARGM (W2661/E2661), which decreased by \$378K for Congressional undistributed adjustments.

\*\*\* The FY00 budget reflects a \$15M Congressional Add for AARGM (E2185), which was decreased by \$60K for Congressional undistributed adjustments.

### A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Advanced Anti-Radiation Guided Missile (AARGM) Project is a Phase III Small Business Innovative Research (SBIR) program to develop and demonstrate a dual-mode guidance section on a HARM airframe. The AARGM Phase III technology demonstration program is designed to demonstrate that a Dual-mode (passive Anti-Radiation Homing (ARH)/active Millimeter Wave (MMW) radar) missile can engage and destroy enemy air defenses in the event that these systems "shut-down" or employ other countermeasures.

The issue of "shut-down" has been a major shortcoming in the suppression of enemy air defenses (SEAD) element of the offensive counter air mission area for the United States Navy and Air Force. Program objectives are to demonstrate an effective and affordable lethal SEAD capability against mobile, relocatable, or fixed air defense threats even in the presence of emitter shutdown or other Anti-Radiation Missile (ARM) countermeasures. The dual-mode technology being developed in the AARGM program has very high potential to solve the problem of "shut-down" not only in the primary weapon for SEAD, the High Speed Anti-Radiation Missile (HARM), but it could be integrated with many other missile airframes.

The AARGM technology demonstration program is an outgrowth of a Phase I and II competitive SBIR program. Phase I and II SBIR efforts successfully demonstrated the feasibility of a dual-mode seeker to address radar "shut-down" issues. Science and Applied Technology (SAT), Inc. (San Diego, CA), was awarded Phase I and II contracts (FY90-93) and was subsequently selected for a Phase III demonstration in FY94. Phase III work is being performed by SAT under NAVAIR contract N00019-94-C-0078. This contractual effort will continue to be incrementally funded, under program element 0205601N, resulting in a cumulative contract value of \$150.4M.

From FY93 through FY98, the AARGM program was a Congressionally mandated program which received its funding as an annual Congressional add. Starting in FY99, AARGM received its program funding through the standard DoD budget appropriation process. The FY99 funds added by Congress are being used to perform risk reduction tasks in preparation for a potential Milestone II Decision in FY 2003.

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Exhibit R-2a, RDT&E Budget Justification  
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### EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205601N

PROJECT NUMBER: E2185

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT TITLE: Advanced Anti-Radiation Guided

Missile(AARGM)

#### 1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) (\$7,040) Contractor developed software evaluation station, including hardware and software development, subsystems assembly and test, and seeker integration tests.
- (U) (\$1,596) Field activity provided AARGM system engineering support of development and systems integration efforts related to the design, test and integration of alternative cost-reduction and risk-reduction technologies in the AARGM anti-Radiation Homing (ARH) subsystem.
- (U) (\$100) Government performed technical analyses and continued technical management, engineering support, and coordination of AARGM Program weapons system technology development program.
- (U) (\$824) Contractor performed program management and engineering services in support of the AARGM technology demonstration program. Provided technical management support and coordination of AARGM Program weapons system technology studies.
- (U) (\$8,805) Contractor performed risk reduction activities. Activities included ARH antenna array performance and affordability and producibility enhancements, MMW radar transceiver performance and affordability enhancements, EMI enhancements, radome material trade studies and advanced target discrimination algorithm development and validation.
- (U) (\$2,120) Field activity assisted in generating required documentation, including life cycle cost analysis and draft ORD development and aircraft integration definitions. Field activity also provided system engineering support for prime contractor.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205601N      PROJECT NUMBER: E2185**  
**PROGRAM ELEMENT TITLE: HARM Improvement      PROJECT TITLE: Advanced Anti-Radiation Guided**

**2. (U) FY 2000 PLAN:**

- (U) (\$5,850) Contractor to conduct chamber tests of the software evaluation station/brassboard. Contractor to continue unique AARGM design and commence captive flight test preparation. Contractor to complete control test vehicle integration, testing, and test analysis. Contractor to finalize development of AARGM prototype, to include hardware/software design upgrades, subsystems assembly and test, prototype integration and testing, and prototype captive carry test.
- (U) (\$3,950) Field activity to provide AARGM system engineering support of development and systems integration efforts. Continue weapon system testing studies to assess weapons technology performance and deficiencies.
- (U) (\$800) Contractor to perform program management and engineering services in support of the AARGM technology demonstration program. Provide technical management support and coordination of AARGM Program weapons system technology studies.
- (U) (\$100) Continue Government technical management, engineering support, and coordination of AARGM Program weapons system technology development program.
- (U) (\$15,000) Contractor to continue risk reduction activities. Activities include performance and affordability enhancements of the Anti-Radiation Homing (ARH) receiver, the MillimeterWave (MMW) Radar Transceiver, the Low-Band Antenna Array Receiver. Related efforts include radome material trade studies, aircraft integration studies, tactical software enhancements, and tactical sensitivity and Electro-Magnetic Interference (EMI) enhancements.

**3. (U) FY 2001 PLAN:**

- (U) (\$4,800) Contractor to complete captive flight testing of the AARGM brassboard. Contractor to complete guided test vehicle integration, testing, and test analysis. Contractor to complete development of AARGM prototype Guided Test Vehicle, to include hardware/software design upgrades, subsystems assembly and test, prototype integration and testing, and prototype captive carry test and data analysis.
- (U) (\$3,279) Field activity to complete AARGM system engineering support of development and systems integration efforts. Complete weapon system testing studies to assess weapons technology performance and deficiencies.
- (U) (\$800) Contractor to perform program management and engineering services in support of the AARGM technology demonstration program. Provide technical management support and coordination of AARGM Program weapons system technology studies.
- (U) (\$100) Complete Government technical management, engineering support, and coordination of AARGM Program weapons system technology development program.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0205601N**      **PROJECT NUMBER: E2185**  
**PROGRAM ELEMENT TITLE: HARM Improvement**      **PROJECT TITLE: Advanced Anti-Radiation Guided Missile(AARGM)**

**(U) B. PROGRAM CHANGE SUMMARY**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	22,428	10,843	7,873
(U) Appropriated Value:	22,480	25,843	0
(U) Adjustments from Pres Budget:	-1,943	14,857	1,106
(U) FY 2001 President's Budget Submit:	20,485	25,700	8,979

**CHANGE SUMMARY EXPLANATION:**

**(U) Funding:**

The FY 1999 net decrease of \$1,943 thousand reflects a \$597 thousand reduction for a Small Business Innovative Research assessment, a \$1,217 thousand reduction for a reprioritization of requirements within the Navy, a \$26 thousand reduction for lapsed liabilities on contracts, and a \$103 thousand decrease for revised economic assumptions.

The FY2000 net increase of \$14,857 reflects a \$15,000 thousand increase for a Congressional Add and a \$143 thousand decrease for an Across-the-Board Congressional rescison.

The FY 2001 net increase of \$1,106 thousand reflects an increase of \$1,200 thousand for the AARGM program, a reduction of \$42 thousand for revised economic assumptions, and a reduction of \$52 thousand for a reprioritization of requirements within the Navy.

(U) Schedule: No changes

(U) Technical: No changes

**(U) C. OTHER PROGRAM FUNDING SUMMARY**

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205601N

PROJECT NUMBER: E2185

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT TITLE: Advanced Anti-Radiation Guided Missile(AARGM)

### (U) D. ACQUISITION STRATEGY:

The HARM AARGM program is an advanced technology demonstration program. AARGM started as a Phase I Small Business Innovative Research (SBIR) program and has evolved into a Phase III SBIR program. The acquisition strategy for the AARGM Program is based upon U.S. Navy operational requirements; the AARGM program is driven by the conclusion derived from an Analysis of Alternatives for advanced Suppression of Enemy Air Defenses (SEAD) technology. Current acquisition strategy is consistent with the FY98 independent program review forwarded to Congress by SECNAV and the FY99 Authorization Report. The innovative research AARGM demonstration is fully funded and executable and will result in fabrication of research articles and limited flight testing of the AARGM dual mode seeker with moderate risk. The U.S. Navy Project Manager is responsible for Program management and execution. AARGM's acquisition strategy delineates Industry and Government responsibilities. The contract strategy (i.e. software evaluation, control test vehicle development and testing, guided test vehicle development and testing) assigns work package tasks to a primary contractor, Science and Applied Technology (SAT) Corp. The SAT contract is funded on an incremental basis with work scope defined in contract options and contract modification statements of work. Government responsibilities include monitoring, technical assessment and validation of contractor technology development. The AARGM technology demonstration is expected to be completed by the end of FY01.

### (U) E. SCHEDULE PROFILE:

The AARGM program is an Advanced Technology Program and therefore does not have a standard detailed Milestone Plan. A list of key actions appears below.

#### AARGM PROGRAM

##### Software Evaluation Station/Brassboard

Hardware/Software Development  
Subsystems Assembly and Test  
Seeker Integration/Test  
Chamber Tests

FY 1999

Continue 1Q/99  
Complete 4Q/99  
Complete 4Q/99  
Begin 4Q/99

FY 2000

Complete 1Q/00  
  
Complete 1Q/00

FY2001

##### Brassboard Captive Flight Tests (CFTs)

Unique Design and CFT Preparation  
Contractor Managed Testing  
Captive Flight Testing

Continue Complete 1Q/00  
1Q/00  
Begin 3Q/00

Complete 3Q/01

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0205601N  
PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: E2185  
PROJECT TITLE: Advanced Anti-Radiation Guided  
Missile(AARGM)

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>	<u>To Complete</u>
AARGM Program Cont'd				
Control Test Vehicles (CTV's)				
Unique Hardware/Software Development				
Subsystems Assembly and Test				
Integration and Test				
CTV Flights Test and Analysis				
	Complete 1Q/99 Begin 1Q/99	Complete 2Q/00 Begin 1Q/00 Complete 3Q/00		
Prototype				
Hardware/Software Design Upgrades				
Subsystems Assembly and Test				
Integration and Testing				
Captive Carry Test				
	Continue Begin 2Q/99	Complete 1Q/00 Complete 1Q/00 Complete 4Q/00 4Q/00		
Guided Test Vehicles (GTV's)				
Hardware/Software Design Upgrades				
Subsystems Assembly and Test				
	Continue Continue	Continue Continue	Complete 3Q/01 Complete 3Q/01	
Integration and Test				
GTV Live Fire Test and Analysis				
		Begin 1Q/00	Complete 4Q/01 4Q01	
Contractor design and trade studies				
System engineering support				
	2Q/99 - 4Q/00 2Q/99 - 4Q/00			

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## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N  
PE Title: HARM Improvement

PROJECT NUMBER: E2185  
PROJECT TITLE: Advanced Anti-Radiation Guided Missile (AARGM)

Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
			Cost	Award Date	Cost	Award Date	Cost	Award Date				
AARGM Adv Technology Development	CPIF SAT, Woodland Hills, CA	59327	7040	Jan 99	5850	Jan 00	4800	Jan 01	0	0	77017	77017
AARGM Engineering Support	WX NAWC WD, China Lake	4486	1596	Oct 98	3950	Oct 99	3279	Oct 00	0	0	13311	
AARGM Engineering/Tech Assessment	CPIF JHU/APL, MD	615	0	N/A	0	N/A	0	N/A	0	0	615	615
AARGM Risk Reduction	CPIF SAT, Woodland Hills, CA	0	8805	Jul 99	15000	Feb 00	0	N/A	0	0	23805	23805
AARGM Engineering Support	WX NAWC WD China Lake	0	2120	Feb 99	0	N/A	0	N/A	0	0	2120	
<b>Subtotal Product Development</b>		<b>64428</b>	<b>19561</b>		<b>24800</b>		<b>8079</b>		<b>0</b>	<b>0</b>	<b>116868</b>	<b>101437</b>

Remarks:

Support

Subtotal Support

Remarks:

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 205601N  
PE TITLE: HARM Improvement

PROJECT NUMBER: E2185  
PROJECT TITLE: Advanced Anti-Radiation Guided  
Missile (AARGM)

Cost Categories: Test & Evaluation	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
				Cost	Date	Cost	Date	Cost	Date				

Subtotal Test & Evaluation

0 0 0 0 0 0 0 0 0 0 0 0 0 0

Remarks:

Management

Travel

WX NAWC AD,  
Patuxent MD  
RX/LOE DCS, Alex VA

100 100 100 100 100 100 100 100 100 100 0 0 400 400  
905 824 Dec 98 800 Jan 00 800 Dec 01 0 3329 3329

Subtotal Management

Remarks:

1005 924 900 900 900 900 900 900 900 900 0 0 3729 3329

Remarks:

Total Cost

65433 20485 25700 8979 0 120597 104766

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# UNCLASSIFIED

## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: E2211

PROJECT TITLE: JAWS

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Budget</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
E2211 Joint Advanced Weapons Systems (JAWS)	927	1,467	2907	3,819	3,778	3,744	3,737	0	23,135
<b>TOTAL</b>	<b>927</b>	<b>1,467</b>	<b>2907</b>	<b>3,819</b>	<b>3,778</b>	<b>3,744</b>	<b>3,737</b>	<b>0</b>	<b>23,135</b>

Quantity of RDT&E Articles

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Joint Advanced Weapon System (JAWS) is the joint service multi-role follow-on weapon system for the current TOW and Hellfire missiles, to support Army and USMC Mission Need Statements (MNS) for weapon requirements for the post-2000 force structure. DON JAWS efforts support joint trade studies, Analysis of Alternatives (AOA), and the development of emerging programs' Milestone 0 documentation. Through Memorandums of Understanding (MOU), the Army is assigned as the lead service. Development programs include The Army Combined Arms Weapon System (TACAWS), the Advanced Missile System-Heavy (AMS-H), the Advanced Precision Kill Weapon System (APKWS) guided rocket, and component upgrades to the currently deployed missile systems. The DON participates in technology modeling and simulation efforts at the Army's Advanced Prototyping, Engineering, and experimentation (APEX) Laboratory. This modeling supports hardware development efforts such as the Future Missile Technology Integration (FMTI) program, to explore advanced guidance, propulsion, and motor capabilities desired by the services. As a simulator, the APEX Lab also assists in developing potential Tactics, Techniques, and Procedures (TTPs), and in operationally validating the requirements set out in the MNS and the ORD. All JAWS efforts support the services' requirements for state-of-the-art capabilities to complement the next generation of aircraft and to defeat the threats of the post-2000 battlefield.

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**UNCLASSIFIED**  
**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0205601N**

**PROGRAM ELEMENT TITLE: HARM Improvement**

**PROJECT NUMBER: E2211**

**PROJECT TITLE: JAWS**

**( U ) PROGRAM ACCOMPLISHMENTS AND PLANS:**

**1. FY 1999 ACCOMPLISHMENTS**

- (U) (\$927) APEX Lab operated and evaluated of Military Operations in Urban Terrain (MOUT), to support USMC requirements for the JAWS to perform in Close Air Support roles in urban areas. Evaluated APKWS guided rocket and potential component upgrades and aircraft integration issues for the current Hellfire missile (\$530K Army and \$397K Government In-house).

**2. FY 2000 PLAN:**

- (U) (\$1,467) Expand APEX evaluation of MOUT operations, as well as incorporation of fixed wing parameters into the APEX model. Evaluation to include Joint Strike Fighter as Modernized Hellfire platform. Continue flight demonstrations/evaluations of advanced guided rocket APKWS (Advanced Precision Kill Weapon System). Evaluate component hardware upgrade potentials for the Hellfire missile. Prove selected technologies meet/fulfill multi-mission requirements set by APKWS and Modernized Hellfire ORD. Continue to examine developing motor, warhead, guidance, and control technologies. (\$850K Army and \$617K government in-house).

**3. FY 2001 PLAN:**

- (U) (\$2,907) Continue APEX evaluation of fixed and rotary wing Modernized Hellfire ORD requirements. Validate that developing technologies are driven by and meet ORD requirements for guided rocket/missile motors, warheads, guidance and control sections, and launchers. Continue evaluation of hardware technology for Modernized Hellfire, APKWS, and Hellfire upgrades. Continue flight demonstrations for Modernized Hellfire, the APKWS guided rocket, and current Hellfire missile upgrade efforts. Evaluate aircraft integration issues associated with proposed weapon systems (\$1,500K Army and \$1,407K government in-house).

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# UNCLASSIFIED

## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: E2211

PROJECT TITLE: JAWS

### A. PROGRAM CHANGE SUMMARY:

(U) FY 2000 President's Budget:	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
	956	1476	2950
(U) Appropriated Value:	993	1476	
(U) Adjustment from Pres Budget Submit:	-29	-9	-43
(U) FY 2001 President's Budget Submit:	927	467	2907

### (U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 decrease of \$29 thousand is due to a SBIR assessment, inflation savings and Below Threshold Reprogrammings (BTRs).

The FY 2000 decrease of reflects a \$9 thousand reduction for an Across-the-Board Congressional Recision.

The FY 2001 net decrease of \$43 thousand reflects a \$24 thousand decrease for revised economic assumptions and a decrease of \$19 thousand for a reprioritization of requirements within the Navy.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

### B. OTHER PROGRAM FUNDING SUMMARY: Not applicable.

RELATED RDT&E: U.S. Army P.E. 0603313A PROJ D263 Future Missile Technology Insertion (FMTI).

C. ACQUISITION STRATEGY: Not an ACAT program with no specific acquisition strategy.

D. SCHEDULE PROFILE: Not applicable.

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## UNCLASSIFIED

EXHIBIT R-3, FY 2001 RDT&amp;E,N COST ANALYSIS

DATE: February 2000

## BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205601N

PROGRAM ELEMENT TITLE: HARM Improvement

PROJECT NUMBER: E2211  
PROJECT TITLE: JAWS

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
				Cost	Date	Cost	Date	Cost	Date				
<b>Product Development</b>													
LCPK	MIPR	MICOM		80	MAR 00								80
APEX	MIPR	MICOM	1965	450	NOV 98	850	FEB 00	1500	NOV 00		6459		11224
<b>Subtotal Product Development</b>			<b>1965</b>	<b>530</b>		<b>850</b>		<b>1500</b>			<b>6459</b>		<b>11304</b>
<b>Support</b>													
LCPK Studies	MIPR	MICOM		50	DEC 99								50
Mission Grips	IPR	GSA		35	FEB 00								35
Engineering Technical Services	C/TMM	DCS Corp	332	215	JAN 99	200	FEB 00	400	JAN 01		1985		3132
<b>Subtotal Support</b>			<b>332</b>	<b>300</b>		<b>200</b>		<b>400</b>			<b>1985</b>		<b>3217</b>
<b>Test and Evaluation</b>													
Testing	WX	CHINA LAKE	382	62	NOV 98	377	JAN 00	971	NOV 00		6490		8282
Phototelesis	MIPR	FORT EUSTIS	29										3
													29
<b>Subtotal Test &amp; Evaluation</b>			<b>411</b>	<b>62</b>		<b>377</b>		<b>971</b>			<b>6490</b>		<b>8311</b>
<b>Management</b>													
Travel	WX	NAVAIR	48	32	NOV 98	30	OCT 99	36	NOV 00		144		290
Travel	MIPR	MICOM		3	NOV 98	10	NOV 99						13
<b>Subtotal Management</b>			<b>48</b>	<b>35</b>		<b>40</b>		<b>36</b>			<b>144</b>		<b>303</b>
<b>Total Cost</b>			<b>2756</b>	<b>927</b>		<b>1467</b>		<b>2907</b>			<b>15078</b>		<b>23135</b>
													<b>3217</b>

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Exhibit R-3, RDT&E Project Cost Analysis  
(Exhibit R-3, Page 23 of 23)

## UNCLASSIFIED

FY 2001 RDT&amp;E,N BUDGET ITEM JUSTIFICATION

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT TITLE: Tactical Data Links

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X1743 LINK-16 Improvements	3,506	4,185	4,176	11,113	11,484	8,595	8,782	CONT	CONT
X2126 ATDLS Integration	45,421	42,225	22,069	20,529	21,154	21,645	18,886	CONT	CONT
TOTAL	48,927	46,410	26,245	31,642	32,638	30,240	27,668	CONT	CONT

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element (PE) develops and improves the Navy's tactical data link systems. It includes the LINK-16 Improvements and Advanced Tactical Data Link Systems (ATDLS) Integration programs.

(U) Link-16 Improvements extends LINK-16 technological improvements to existing and developing U.S. Navy data link systems, including LINK-11 and LINK-22. Development of the NATO Improved LINK-Eleven (NILE) project is a major element of this program. The U.S. is the lead technical nation for LINK-22 development for the NILE office. LINK-16 improvements will allow more effective employment of fleet units by increasing the timeliness, accuracy, and content of tactical data transfer.

(U) ATDLS Integration includes current efforts to develop translation tools between Tactical Digital Information Links (TADILS) and integration of the Multifunctional Information Distribution System - Low Volume Terminal (MIDS-LVT) into U.S. Navy platforms. MIDS-LVT is a multinational cooperative development program that will provide selected U.S. Navy ships and space constrained tactical fighter aircraft with LINK-16 capability through the development of a terminal that is functionally identical to the Joint Tactical Information Distribution System (JTIDS) Class II terminal, but, through the use of Very High Speed Integrated Circuit (VHSIC) and Microwave Monolithic Integrated Circuits (MMIC) technology, is one-half the weight and one-third the size of the JTIDS terminal.

R-1 Shopping List - Item No 169-1 of 169-15

UNCLASSIFIED

Exhibit R-2, RDT&amp;E Budget Item Justification

UNCLASSIFIED

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT TITLE: Tactical Data Links

(U) Common Data Link Management System (CDLMS) provides translation between TADILs and will isolate all tactical data link equipment, message standards and protocols from tactical information processors. This will provide a flexible capability for rapidly exchanging tactical information using a single database for translating various link formats while remaining completely independent of communications equipment and tactical data computing systems. Link 11 improvements include the Common Systems Data Terminal Set (CSDTS) that will improve existing computer-to-computer, digital radio communications in the HF and UHF radio frequency bands among Combat Direction System (CDS) equipped ships, submarines, aircraft and shore sites.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

R-1 Shopping List - Item No 169-2 of 169-15

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Exhibit R-2, RDT&E Budget Item Justification

## UNCLASSIFIED

## FY 2001 RDT&amp;E,N PROJECT JUSTIFICATION

DATE: February 2000

## BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: X1743

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: Link 16 Improvements

## (U) COST (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X1743 LINK-16 Improvements	3,506	4,185	4,176	11,113	11,484	8,595	8,782	CONT	CONT

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Link-16 Improvements extends LINK-16 technological improvements to existing and developing U.S. Navy data link systems, including LINK-11 and LINK-22. Near term LINK-11 improvements include: Mobile Universal Link Translator System (MULTS) upgrade, Common Shipboard Data Terminal Set (CSCTS), LINK-11 Baseline Freeze message standard work, and the NATO Improved LINK-11 (NILE) project. LINK-22 will pass TADIL-J data elements beyond the line of sight (HF) using a Time Division Multiple Access (TDMA) protocol and the improved LINK-11 waveform. These projects will allow more effective employment of fleet units by increasing timeliness, accuracy, and content of tactical data transfer.

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Exhibit R-2a RDT&amp;E: Project Justification (Project X1743)

UNCLASSIFIED

FY 2001 RDT&E,N PROJECT JUSTIFICATION

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: X1743

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: Link 16 Improvements

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 Accomplishments:

- (U) (\$1,136) Continued design and development of Subphase 2 for the NILE Reference System (NRS).
- (U) (\$1,435) Continued Link-22 system development. Link-22 shall receive a NILE SNC Beta software version and shall conduct preliminary performance testing in a laboratory environment. Crypto design and message standards will be evaluated.
- (U) (\$935) Began combined CDLMS/Link 22 program enhancements.

2. (U) FY 2000 PLAN:

- (U) (\$271) Complete design and development of Subphase 2 for the NILE Reference System (NRS).
- (U) (\$400) Commence validation of Link 22 design to ensure interoperability with NILE Reference System (NRS) under NILE In-Service Support Phase MOU.
- (U) (\$1,154) Continue Link-22 system development. Link-22 program shall perform final SNC beta software verification and performance tests. Message standards and Signal Processing Controller functions will be defined for U.S. implementation.
- (U) (\$2,360) Continue combined CDLMS/Link-22 program enhancements. CDLMS/Link-22 specifications/designs will be baselined for final system integration.

3. (U) FY 2001 PLAN

- (U) (\$400) Continue validation of Link 22 design to ensure interoperability with NILE Reference System (NRS) under NILE In-Service Support Phase MOU.
- (U) (\$2,547) Continue Link-22 system development. Link-22 Crypto designs, message standards, and test tools will be assembled and integrated.
- (U) (\$1,229) Continue combined CDLMS/Link-22 program enhancements. System enhancements shall undergo system integration supporting Link-22 Crypto designs, message standards, and test tools.

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Exhibit R-2a RDT&E: Project Justification (Project X1743)

## UNCLASSIFIED

## FY 2001 RDT&amp;E,N PROJECT JUSTIFICATION

DATE: February 2000

## BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: X1743

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: Link 16 Improvements

## B. (U) PROGRAM CHANGE SUMMARY:

## (U) Funding:

FY 1999: Reflects Congressional reduction for Inflation Savings (- \$20K). Transfer for SBIR/STTR (-\$109K), LOCO-GPSI Reprogramming (- \$37K) and Miscellaneous Department Adjustments (- \$749K).

FY 2000: Reflects Congressional Adjustment (- \$22K) . \$680K Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638

FY 2001: Miscellaneous Department Adjustments (- \$36K).

(U) Schedule: Delay Link 22 IOC from FY02 to FY04 in order to implement extensive C2P upgrades to meet increased Link-22 processing requirements.

(U) Technical: Not applicable.

## C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in Thousands)

NUMBER TITLE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) OPN Line 2614 ATDLS	28,787	19,036	19,153	14,908	16,262	33,463	32,173	CONT	CONT

D. (U) ACQUISITION STRATEGY: NILE Reference System, Link 22 system development and CDLMS/Link 22 program enhancement are utilizing existing cost plus contracts.

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Exhibit R-2a RDT&amp;E: Project Justification (Project X1743)

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FY 2001 RDT&E,N PROJECT JUSTIFICATION

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: X1743

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: Link 16 Improvements

E. (U) SCHEDULE PROFILE:

<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>TO COMPLETE</u>
----------------	----------------	----------------	--------------------

Program  
Milestones

Engineering  
Milestones

T&E  
Milestones

NILE S/W Test  
2Q/00

CDLMS/Link 22 S/W test  
4Q/02

Link-22  
DT 4Q/03

Link-22  
OT 1Q/04

Contract  
Milestones

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Exhibit R-2a RDT&E: Project Justification (Project X1743)



## UNCLASSIFIED

FY 2001 RDT&amp;E,N PROJECT COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: X1743

PROJECT TITLE: Link 16 Improvements

PROGRAM ELEMENT TITLE: Tactical Data Links

Exhibit R-3 Cost Analysis (page 1)												
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY 01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
NATO Improved Link Eleven	CPFF	Logicon	1,022	1,136	Various	671	Various	400	Various	800	4,029	4,029
LINK-22	WX	SPAWARSSCTR San Diego, CA	1,304	1,018	Various	810	Various	2,155	Various	Cont.	Cont.	Cont.
LINK 22	Various	Various		356	Various	300	Various	300	Various	Cont.	Cont.	Cont.
C2P Improvements	Various	Various	1,576	861	Various	2,268	Various	1,184	Various	Cont.	Cont.	Cont.
Subtotal Product Development			3,902	3,371		4,049		4,039		Cont.	Cont.	Cont.
Remarks:												
Subtotal Support												

R-1 Shopping List - Item No 169-7 of 169-15

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Exhibit R-3, Project Cost Analysis

## UNCLASSIFIED

FY 2001 RDT&amp;E,N PROJECT COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: X1743

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: Link 16 Improvements

Exhibit R-3 Cost Analysis (page 2)												
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY 01 Cost	FY01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test and Evaluation	Various	Various	272								272	272
Subtotal T&E			272								272	272
Remarks												
Engineering Support and Travel	Various	Various	270	135	Various	136	Various	137	Various	Cont.	Cont.	
Subtotal Management			270	135		136		137				
Remarks												
Total Cost			4,444	3,506		4,185		4,176		Cont.	Cont.	Cont.
Remarks												

R-1 Shopping List - Item No 169-8 of 169-15

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Exhibit R-3, Project Cost Analysis

## UNCLASSIFIED

## FY 2001 RDT&amp;E,N PROJECT JUSTIFICATION

DATE: February 2000

## BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: X2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

(U) COST (Dollars in Thousands)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL
PROJECT NUMBER & TITLE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
X2126 ATDLS Integration	45,421	42,225	22,069	20,529	21,154	21,645	18,886	CONT	CONT

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The ATDLS Integration program will integrate the Multifunctional Information Distribution System - Low Volume Terminal (MIDS-LVT) LINK-16 terminal into U.S. Navy platforms. This multinational (U.S., France, Germany, Italy, and Spain) cooperative development program was established to design, develop, and deliver low-volume lightweight tactical information system terminals for U.S. and foreign fighter aircraft, helicopters, ships and ground sites. The terminals are designed as a Pre-Planned Product Improvement (P<sup>3</sup>I) of the Joint Tactical Information Distribution System (JTIDS) Time Division Multiple Access (TDMA) Class II terminal. The goal of the MIDS-LVT program is to produce a terminal that is smaller, lighter, fully compatible with, and as capable as the JTIDS TDMA Class 2 terminals, but suitable for use in platforms that cannot accommodate the bulkier, heavier JTIDS TDMA Class II equipment. This project includes the costs to integrate and test MIDS on the Navy's F/A-18 and selected ship platforms. ATDLS Integration of the MIDS-LVT will also provide selected U.S. Navy and U.S. Marine Corps tactical aircraft, U.S. Navy ships, and U.S. Marine Corps ground units with crypto-secure, jam resistant, low-probability-of-exploitation communication of tactical data and voice at a high data rate. It will have additional capabilities of common grid navigation and automatic relay inherent in the equipment that will enable long-range communication and provide jam resistance. The system will be interoperable among all services and NATO/Allied users equipped with MIDS-LVT or JTIDS Class II/IIA.

(U) ATDLS Improvement program also develops new and improved capabilities for Navy TADIL-J users. The Command and Control Processor (C2P) is a software development effort that provides an interface between the TADILs (Link 4A, 11, and 16) and major surface ship Command and Control Systems (Advanced Combat Direction System (ACDS) and AEGIS C&D). Common Data Link Management System (CDLMS) is a Pre-planned Product Improvement (P3I) of the C2P. The CDLMS will provide translation between TADILs and isolate all tactical data link equipment, message standards and protocols from tactical information processors. This will provide a flexible capability for rapidly exchanging tactical information using a single database for translating various link formats while remaining completely independent of communications equipment and tactical data computing systems.

(U) This project also funds: (1) the development required to accommodate expanded LINK-16 operational capabilities for additional warfare areas, (2) development of automated network management aids, and (3) systems engineering and contractor support efforts.

(U) Additional terminal development costs are funded in program element 0604771D.

## (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

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Exhibit R-3, Project Justification

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FY 2001 RDT&E,N PROJECT JUSTIFICATION

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: X2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

1. (U) FY 1999 Accomplishments:

- (U) (\$29,774) Continued F/A-18 MIDS integration software and aircraft design modifications and testing.
- (U) (\$4,934) Continued TADIL-J System Engineering to include investigating future capabilities and enhancements and ensuring Naval upgrades are interoperable with Joint U.S. and allied forces, such as joint range extension and enhanced throughput.
- (U) (\$5,931) Continued Performance Upgrades including C2P Model 5 improvements, Common Data Link Management System (CDLMS) development, and Satellite-TADIL-J development.
- (U) (\$2,615) Continued MIDS on Ship development and testing.
- (U) (\$1,267) Commenced Dual Net Link 11 development in Common Data Link Management System (CDLMS).
- (U) (\$900) Commenced TADIL-J architecture study for Korean Air Defense System Improvements.

2. (U) FY 2000 PLAN:

- (U) (\$32,925) Continue F/A-18 MIDS integration software and aircraft design modifications and testing.
- (U) (\$2,436) Continue TADIL-J System Engineering to include investigating future capabilities and enhancements and ensuring Naval upgrades are interoperable with Joint U.S. and allied forces such as joint range extension and enhanced throughput.
- (U) (\$5,085) Continue Performance Upgrades including C2P Model 5 improvements, Common Data Link Management System (CDLMS) development, and Satellite-TADIL-J development.
- (U) (\$1,779) Continue MIDS on Ship development and testing.

3. (U) FY 2001 PLAN

R-1 Shopping List - Item No 169-10 of 169-15

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Exhibit R-3, Project Justification

UNCLASSIFIED

FY 2001 RDT&E,N PROJECT JUSTIFICATION

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: X2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

- (U) (\$17,140) Continue F/A-18 MIDS integration software and aircraft design modifications and testing.
- (U) (\$2,412) Continue TADIL-J System Engineering to include investigating future capabilities and enhancements and ensuring Naval upgrades are interoperable with Joint U.S. and allied forces such as joint range extension and enhanced throughput.
- (U) (\$1,917) Continue Performance Upgrades including C2P Model 5 Improvements, Common Data Link Management System (CDLMS) development, and Satellite-TADIL-J development.
- (U) (\$600) Complete MIDS on Ship development and testing.

B. (U) PROGRAM CHANGE SUMMARY:

(U) Funding:

FY1999: Reflects Congressional reduction for Inflation Savings (- \$205K). Transfer for SBIR/STTR (-\$1,141K), adjustment for Dual Net Link 11 (\$1,267K), LOCO-GPSI Reprogramming (- \$373K), Korean Air Defense System Improvements (+ \$900K) and Miscellaneous Department Adjustments (+ \$243K).

FY 2000: Reflects Congressional Adjustment (- \$234K). \$ 594 K Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

FY 2001: Increase for F/A-18 MIDS Integration (\$4,000K) and Miscellaneous Department Adjustments (- \$338K).

(U) Schedule: MIDS DAB MS III has slipped from 3Q/00 to 2Q/01 as a result of EMD terminal immaturity.

(U) Technical: Not applicable.

R-1 Shopping List - Item No 169-11 of 169-15

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Exhibit R-3, Project Justification

## UNCLASSIFIED

## FY 2001 RDT&amp;E,N PROJECT JUSTIFICATION

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: X2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

## C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in Thousands)

NUMBER TITLE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	COMPLETE	TO	TOTAL PROGRAM
(U) APN LINE										
LI 052500 F/A-18	9,331	46,994	49,744	56,500	48,186	48,869	40,469	CONT	CONT	CONT
LI 054400 E2C	644	480	728	1,222	1,950	708	682	CONT	CONT	CONT
(U) RDT&E,DA	29,809	28,616	16,250	16,478	16,790	17,116	17,449	CONT	CONT	CONT
(U) OPN LI 2614 ATDLS	28,787	19,036	19,153	14,908	16,262	33,463	32,173	CONT	CONT	CONT
(U) SCN	11,900	19,600	26,247	22,076	24,137	22,376	20,946	CONT	CONT	CONT

## (U) RELATED RDT&amp;E:

PE 0604771D/P771 - Link 16: Link 16 systems engineering support.

PE 0604771D/P773 - MIDS: MIDS-LVT terminal development.

D. (U) ACQUISITION STRATEGY: F/A-18 MIDS aircraft integration is utilizing cost plus fix fee contract on an R&D Basic Ordering Agreement with Boeing. MIDS integration and testing, TADIL-J systems engineering, and performance upgrades development are utilizing existing cost plus contracts.

R-1 Shopping List - Item No 169-12 of 169-15

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Exhibit R-3, Project Justification

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FY 2001 RDT&E,N PROJECT JUSTIFICATION

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: X2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

E. (U) SCHEDULE PROFILE

FY 1999

FY 2000

FY 2001

TO COMPLETE

Program  
Milestones

LRIP Rvw 2Q/00

DAB MS III 2Q/01

IOC 2Q/01 Ship  
IOC 2Q/03 Air

Engineering  
Milestones

T&E  
Milestones

F/A-18 DT-IIA-4 1Q/99  
F/A-18 DT-IIA-3 4Q/99  
F/A-18 OT-IIA-2-2Q/00  
F/A-18 DT-IIA-5 2Q/00  
F/A-18 OT-IIA-3-2Q/00

F/A-18 DT-IIA-6 1Q/01  
F/A-18 OT-IIA-4 4Q/01

F/A-18 DT-11A-7 1Q/02  
F/A-18 TECHEVAL 4Q/02  
F/A-18 OPEVAL 1Q/03  
F/A-18 FOT&E 3Q/03

Ship DT/OT-IIB-1 3Q/00 Ship DT/OT-IIB-2 1Q/01

Contract  
Milestones

MIDS LRIP contract 2Q/00

R-1 Shopping List - Item No 169-13 of 169-15  
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Exhibit R-3, Project Justification

## UNCLASSIFIED

FY 2001 RDT&amp;E,N PROJECT COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: X2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

Exhibit R-3 Cost Analysis (page 1)														
APPROPRIATION: RDT&E,N BUDGET ACTIVITY: 7				PROGRAM ELEMENT: 0205604N										
				Tactical Data Links										
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract		
F/A-18 Integration	PD	NAVAIRSYSCOM PAX River, MD	71,430	18,348	Various	17,659	Various	7,920	Various	34,303	149,660	149,660		
TADIL-J System Engineering	WX	SPAWARSYSCTR San Diego, CA	22,462	1,700	Various	700	Various	545	Various	Cont	Cont			
TADIL-J System Engineering	Various	Various	502	2,287	Various	1,392	Various	1,168	Various	Cont.	Cont.			
MIDS on Ship	CPIF	GEC Marconi Wayne, NJ	7,718	1,600	Dec 98	900	Various	300	Dec 00		10,518	10,518		
MIDS on Ship	Various	Various	41,407	540	Various	400	Various							
Performance Upgrades	WX	SPAWARSYSCOM San Diego, CA	3,652	3,818	Various	4,414	Various	907	Various	Cont.	Cont.			
Performance Upgrades	Various	Various		1,804	Various	103	Various							
Air Defense System Integrator	CPFF	Adv Programming Concepts, TX	2,059											
Dual Net Link 11	WX	Various		1,267	Various									
Korean Air Defense Sys Impr				900	9/99						900	900		
Subtotal Product Development	CPFF	JHU/APL	149,230	32,264		25,568		10,840		Cont.	Cont.	Cont.		
Remarks														

R-1 Shopping List - Item No 169-14 of 169-15

UNCLASSIFIED

Exhibit R-3, Project Cost Analysis



## UNCLASSIFIED

FY 2001 RDT&amp;E,N PROJECT COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205604N

PROJECT NUMBER: X2126

PROGRAM ELEMENT TITLE: Tactical Data Links

PROJECT TITLE: ATDLS Integration

Exhibit R-3 Cost Analysis (page 2)											
APPROPRIATION: RDT&E,N						PROGRAM ELEMENT: 0205604N					
BUDGET ACTIVITY: 7						Tactical Data Links					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost to Complete	Target Value of Contract
Subtotal Support											
Remarks											
Test and Evaluation	Various	Various	3,580	55	8/99	200	12/99	150	12/00	500	4,485
MIDS F/A-18 T&E	Various	Various	4,549	11,371	Various	15,101	Various	9,699	Various	11,988	52,708
MIDS on Ship T&E	WX	SPAWARSSCOM San Diego, CA		350	Various	300	Various	300	Various		950
MIDS Test Assets	SS/CPAF /IF	MIDSCO Fairfield, NJ	6,594								6,594
Subtotal T&E			14,723	11,776		15,601		10,149		Cont.	Cont.
Remarks											
ATDLS Engineering	RCP	MITRE	606	710		100		105		Cont.	Cont.
Engineering Support and Travel	Various	Various		671	Various	956	Various	975	Various	Cont.	Cont.
Subtotal Management			606	1,381		1,056		1,080		Cont.	Cont.
Total Cost			164,559	45,421		42,225		22,069		Cont.	Cont.

R-1 Shopping List - Item No 169-15 of 169-15

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Exhibit R-3, Project Cost Analysis

UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification									
DATE: February 2000									
APPROPRIATION/BUDGET ACTIVITY									
RDT&E, N/ 07									
R-1 ITEM NOMENCLATURE									
Surface ASW Combat System Integration/ 0205620N									
COST (\$ in Millions)									
	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total PE Cost									
High Dynamic Range Low Cost	15.692	23.504	29.585	24.240	13.055	9.968	6.395	CONT.	CONT.
Towed Array Receiver/ V2662	3.872	6.962	0.000	0.000	0.000	0.000	0.000	0.000	10.834
ASW Combat Systems Integration	1.897	2.944	0.000	0.000	0.000	0.000	0.000	0.000	4.841
V0896									
Surface ASW System Improvements	9.923	13.598	29.585	24.240	13.055	9.968	6.395	CONT.	CONT.
V1916									
Quantity of RDT&E Articles									
<p>A. Mission Description and Budget Item Justification: The objective of this program element is to significantly improve existing AN/SQQ-89(V) and Surface Ship Sonar System capabilities. It will improve AN/SQQ-89(V) Measures of Performance (MOP) by enhancing detection, tracking, classification, data processing and display capabilities, and increasing acoustic sensor frequency bandwidth. This PE will take advantage of the AN/SQQ-89(V) open system architecture to develop and integrate the Multi-Function Towed Array (MFTA) with active sonar bistatics and torpedo defense capabilities into the AN/SQQ-89(V) as a backfit program for DDG51 class ships (AN/SQQ-89A(V)15). Further, this program element, under project V2662 in FY 1999 and FY 2000, will produce a single Towed Array Acoustic Intercept Subsystem (AISS) ship set and transition the AISS technology to the surface combatant AN/SQQ-89 A(V)15 baseline for integration.</p> <p>Note: In accordance with 15 USC 638, \$508M in FY 2000 is reserved for the Small Business Innovation Research (SBIR) assessment.</p>									
B P Ch S	FY 1999	FY 2000	FY 2001						
FY 2000 President's Budget:	13.000	16.633	19.595						
Appropriated Value:	13.390	23.633							
Adjustments to FY 1999/2000 Appropriated Value/									
FY 2000 President's Budget:	+2.302	-0.129	+9.990						
FY 2001 PRES Budget Submit:	15.692	23.504	29.585						
<p>Funding: FY 1999 increases for sponsor directed Below Threshold Reprogramming (BTR) (+1,000) and Composite Sonar Dome Prototype (+2,000). FY 1999 decreases for Small Business Innovative Research (SBIR) transfer (-0.246), Congressional undistributed reductions (-0.437), and Minor Pricing Adjustments (-0.015). FY 2000 decreases for Congressional Across-the-Board reductions (-0.129). FY 2001 increase for AN/SQQ-89A(V)15 program (+10.643) and Navy Working Capital Funds (NWCFF) rate adjustments (+0.132). FY 2001 changes for SQQ-89 Improvements (+\$10.643). Strategic Sourcing Program (-\$.030), offsets to finance higher priority O&amp;MN shortfall (-\$.453), and minor pricing adjustments (-\$.170).</p>									

R-1 SHOPPING LIST - Item No. 170 - 1 of 170 - 12

Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, page 1 of 12)

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CLASSIFICATION:

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EXHIBIT R-2a, RDT&E Project Justification		DATE:		February 2000	
APPROPRIATION/BUDGET ACTIVITY		Surface ASW Combat System Integration/ 0205620N		ASW Combat System Integration/ V0896	
RDT&E, N/ 07					
COST (\$ in Millions)		FY 1999		FY 2000	
		1.897		2.944	
Project Cost				0.000	
RDT&E Articles Qty				0.000	
A. Mission Description and Budget Item Justification: The Surface ASW Combat System Integration project will develop the MFTA system design specification, common processing subsystem, and design and fabricate the MFTA array hardware. The MFTA will improve AN/SQLQ-89(V) MOP by increasing sensor acoustic bandwidth, providing towed array torpedo defense and active sonar bistatic receive capability, and making processing improvements to overcome the negative effects of shallow water. These MOPs relate directly to platform survivability and operational effectiveness in the littoral environment. Project V1916 will integrate the MFTA with active sonar bistatics and torpedo defense capabilities into the AN/SQLQ-89(V) as a backfit program for DDG51 class ships (AN/SQLQ-89A(V)15).					
PROGRAM ACCOMPLISHMENTS AND PLANS:					
1. (U) FY 1999 Accomplishments:					
(\$0.694) Completed system design specification development for the MFTA array and processor. Completed array Preliminary Design Review (PDR).					
(\$0.600) Completed design of the MFTA processing.					
(\$0.303) Began design and fabrication of MFTA array hardware and performed array mechanical critical item testing.					
(\$0.300) Completed array self-noise critical item testing.					
2. (U) FY 2000 Plan:					
(\$0.600) Complete array Critical Design Review (CDR).					
(\$2.044) Complete design and fabrication of MFTA array hardware and deliver pre-production prototype.					
(\$0.300) Coordinate and conduct 4Q MFTA sea test and prepare analysis of results.					

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CLASSIFICATION:

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EXHIBIT R-2a, RDT&E Project Justification		DATE:	February 2000						
APPROPRIATION/BUDGET ACTIVITY	Surface ASW Combat System Integration/ 0205620N	ASW Combat System Integration/ V0896							
RDT&E, N/ 07									
B. Other Program Funding Summary:									
	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
OPN Budget Line Item 213600/5	23.2	31.7	14.3	23.3	39.7	58.6	63.5	342.6	596.9
Related RDT&E:	N/A								
C. Acquisition Strategy: Development work in this project is performed primarily by:									
<ul style="list-style-type: none"><li>- Naval Undersea Warfare Center, Newport - AN/SQQ-89(V) Technical Direction Agent</li><li>- Lockheed Martin Corporation - Incumbent AN/SQQ-89(V) Design Agent. This contract was awarded competitively and will extend through FY 2002.</li><li>- Chesapeake Sciences Corporation - SBIR Phase III Award (June 98) for common Navy Towed Array Telemetry.</li><li>- Applied Hydro Acoustics - Competitive Contract awarded by SPAWARSYSCOM.</li></ul>									
Procurement of the MFTA array components will be from Chesapeake Sciences Corporation and array fabrication will be done by Lockheed Martin Corporation.									

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CLASSIFICATION:

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EXHIBIT R-2a, RDT&E Project Justification		DATE:	February 2000
APPROPRIATION/BUDGET ACTIVITY	Surface ASW Combat System Integration/ 0205620N	ASW Combat System Integration/ V0896	
<b>RD&amp;E, N/ 07</b>			
D. Schedule Profile			
Program Milestones	FY 1999	FY 2000	FY 2001
		Complete Development of MFTA System	FY 2002
Engineering Milestones			FY 2003
			FY 2004
T&E Milestones			FY 2005
Contract Milestones			

R-1 SHOPPING LIST - Item No. 170 - 4 of 170 -12

Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, page 4 of 12)

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)										DATE:		February 2000	
APPROPRIATION/BUDGET ACTIVITY				Surface ASW Combat System Integration/				ASW Combat System Integration/					
RDT&E, N/ 07				0205620N				V0896					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract	
Primary HW & SW Development	Var.	Misc.	0.200	1.797	Var.	2.784	Var.			0.000	4.781		
											0.000		
											0.000		
											0.000		
											0.000		
											0.000		
Subtotal Product Development			0.200	1.797		2.784		0.000		0.000	4.781		
Remarks:													
Studies, Analysis, & Evaluations	Var.	Misc.	0.100							0.000	0.100		
Engineering & Technical Services	Var.	Misc.	0.100							0.000	0.100		
											0.000		
											0.000		
											0.000		
											0.000		
Subtotal Support			0.200	0.000		0.000		0.000		0.000	0.200		
Remarks:													

R-1 SHOPPING LIST - Item No. 170 - 5 of 170 - 12

Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 5 of 12)

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE:		February 2000	
APPROPRIATION/BUDGET ACTIVITY										ASW Combat System Integration/			
RDT&E, N/ 07										V0896			
Surface ASW Combat System Integration/										ASW Combat System Integration/			
0205620N													
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract	
											0.000		
											0.000		
											0.000		
											0.000		
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000		
Remarks:													
Program Management Support	Var.	Misc.	0.097	0.100	Var.	0.160	Var.			0.000	0.357		
											0.000		
											0.000		
											0.000		
											0.000		
Subtotal Management			0.097	0.100		0.160		0.000		0.000	0.357		
Remarks:													
Total Cost			0.497	1.897		2.944		0.000		0.000	5.338		

R-1 SHOPPING LIST - Item No. 170 - 6 of 170 - 12

Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 6 of 12)

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CLASSIFICATION:

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EXHIBIT R-2a, RDT&E Project Justification		DATE:		February 2000						
APPROPRIATION/BUDGET ACTIVITY	Surface ASW Combat System Integration/ 0205620N	Surface ASW System Improvements/ V1916								
RDT&E, N/ 07		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
COST (\$ in Millions)		9.923	13.598	29.585	24.240	13.055	9.968	6.395	CONT.	CONT.
Project Cost										
RDT&E Articles Qty										
<p>A. Mission Description and Budget Item Justification: The Surface ASW System Improvements project will support essential performance enhancements on AN/SQQ-89(V) and Surface Ship Sonar Systems. This project will develop and refine active classification and display upgrades to support implementation in both the AN/SQQ-89(V) hull subsystem and the MFTA. This project will integrate the MFTA, completed in project V0896, with active sonar bistatics and torpedo defense capabilities, into the AN/SQQ-89(V) as a backfit program on DDG51 class ships (AN/SQQ-89A(V)15). Additionally, project V1916 will develop the AN/SQQ-89(V) design and interface with the Light Airborne Multi-Purpose System (LAMPS) Mk III Blk II system, and improve torpedo recognition algorithms.</p> <p>PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>1. (U) FY 1999 Accomplishments:</p> <p>(\$1.300) Completed analysis of data from Towed Active Receive System (TARS) FY 1998 sea tests.</p> <p>(\$0.700) Completed performance specification development for the TARS Engineering Development Model (EDM) to include active classification display upgrades to support implementation with the MFTA.</p> <p>(\$1.410) Continued transition of active classification upgrade algorithms for Echo Tracker Classifier (ETC) to support implementation with the hull sensor and mid-frequency active MFTA.</p> <p>(\$0.300) Evaluated feasibility of an ASW Data Link (virtual) to support multi-platform coordinated ASW.</p> <p>(\$0.180) Continued support of Navy-wide towed array commonality development efforts.</p> <p>(\$0.410) Completed at-sea test, DT-IIIAN, and analysis on an AN/SQQ-89(V)6 system with adjunct processing including torpedo alertment capabilities.</p> <p>(\$0.200) Began program planning and requirements definition for the LAMPS Mk III Blk II system, identified critical system performance items, established new interfaces for the KuBand LAMPS Common Datalink (CDL), and explored methods of backfitting these changes to the maximum number of ships.</p> <p>(\$1.200) Continued upgrades to the Torpedo Recognition Alertment Functional Segment (TRAFS) as well as develop improved torpedo detection algorithms for the AN/SQQ-89(V).</p>										

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE:	February 2000
APPROPRIATION/BUDGET ACTIVITY	Surface ASW Combat System Integration/ 0205620N	Surface ASW System Improvements/ V1916		
RDT&E, N/ 07				
(\$0.147) Provided performance data analysis, modeling, and simulation using MOP and Measures of Effectiveness (MOE) methods.				
(\$2.076) Completed system requirements specification PDR and System Design Review (SDR) for the AN/SQQ-89A(V)15, including the integration of the MFTA, active sonar bistatics, and torpedo defense capabilities.				
(\$2.000) Contracted for completion of preliminary design, test and analysis, preparation of detail design, tooling modifications and development of room-temperature-cured composite sonar dome prototype.				
2. (U) FY 2000 Plan:				
(\$2.484) Develop active sonar bistatic processing (ETC) to support implementation with the AN/SQQ-89A(V)15.				
(\$1.336) Develop torpedo detection, classification, and localization (DCL) software to support implementation with the AN/SQQ-89A(V)15.				
(\$9.391) Begin integration of MFTA, active sonar bistatic processing (ETC), and torpedo detection, classification, and localization software into the AN/SQQ-89A(V)15.				
(\$0.387) Conduct Computer Aided Dead Reckoning Tracer (CADRT) TECHEVAL and operational test and evaluation, OT-III G, of an AN/SQQ-89(V)6 system with active adjunct processing and improved contact management.				
3. (U) FY 2001 Plan:				
(\$3.237) Complete active sonar bistatic processing (ETC) to support implementation with the AN/SQQ-89A(V)15.				
(\$1.153) Complete torpedo detection, classification, and localization software to support implementation with the AN/SQQ-89A(V)15.				
(\$22.815) Continue integration of MFTA, active sonar bistatic processing (ETC), and torpedo detection, classification, and localization software into the AN/SQQ-89A(V)15.				
(\$2.000) Begin LAMPS MkIII Blk II integration, write system performance specification changes, complete KuBand LAMPS data definition, write shipboard and aircraft computer program design changes, and begin writing source code changes.				

R-1 SHOPPING LIST - Item No. 170 - 8 of 170 - 12

# UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, 8 page of 12)

EXHIBIT R-2a, RDT&E Project Justification				DATE:	February 2000				
APPROPRIATION/BUDGET ACTIVITY	Surface ASW Combat System Integration/ 0205620N	Surface ASW System Improvements/ V1916							
RDTE, N/ 07									
(\$0.080) Complete analysis of FY 2000 CADRT TECHEVAL and OT-IIIIG at-sea test of an AN/SQQ-89(V)6 system with active adjunct processing and improved contact management. (\$0.300) Coordinate and conduct integrated AN/SQQ-89A(V)15 sea test.									
B. Other Program Funding Summary:									
	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
OPN Budget Line Item 213600/5	23.2	31.7	14.3	23.3	39.7	58.6	63.5	342.6	596.9
Related RDTE:	N/A								
C. Acquisition Strategy: Development work in this project is performed primarily by:									
- Naval Undersea Warfare Center, Newport - AN/SQQ-89(V) Technical Direction Agent - Naval Surface Warfare Center, Dahlgren - AN/SQQ-89(V) Technical Direction Agent - Lockheed Martin Corporation - Incumbent AN/SQQ-89(V) Design Agent. This contract was awarded competitively and will extend through FY 2002. - Digital System Resources, Inc. - SBIR Phase III award for common acoustic processor.									
Procurement of production AN/SQQ-89A(V)15 ship sets developed in this project will commence in FY 2003.									

**Exhibit R-2a, RDT&E Project Justification**  
(Exhibit R-2a, page 9 of 12)

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification				DATE:	February 2000		
APPROPRIATION/BUDGET ACTIVITY		Surface ASW Combat System Integration/ 0205620N		Surface ASW System Improvements/ V1916			
RD&E, N/ 07							
D5 Schedule Profile							
Program Milestones	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
		Begin AN/SQQ-89A(V)15 Integration	Begin LAMPS Mk III Blk II Integration		First AN/SQQ-89A(V)15 Install		Complete LAMPS Mk III Blk II Integration First AN/SQQ-89A(V)15 Production Unit Installed
Engineering Milestones	2Q Completed TARS ADM Sea Test Analysis		4Q Integrated AN/SQQ-89A(V)15 Sea Test	Complete AN/SQQ-89A(V)15 Integration and Fabrication of First Unit			
	4Q Completed TARS EDM Performance Spec Dev						
T&E Milestones	4Q Completed AN/SQQ-89A(V)15 SDR				4Q AN/SQQ-89A(V)15 DT Sea Test		
	4Q DT-IIIAN Sea Test	2Q CADRT TECHEVAL					
		3Q OT-IIIG Sea Test				2Q AN/SQQ-89A(V)15 OT Sea Test	
Contract Milestones							

Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, page 10 of 12)

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CLASSIFICATION:

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Exhibit R-3 Cost Analysis (page 2)										DATE:		February 2000	
APPROPRIATION/BUDGET ACTIVITY				Surface ASW Combat Systems Integration/				Surface ASW System Improvement/					
0205620N				V1916									
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract	
Development & Operational T&E	Var.	Misc.	3,600	0,410	Var.	0,387	Var.	0,080	N/A	CONT.	CONT.		
Miscellaneous T&E	Var.	Misc.	2,300	0,147	Var.	0,000	Var.	0,000	Var.	CONT.	CONT.		
Subtotal T&E			5,900	0,557		0,387		0,080		CONT.	CONT.		
Remarks:													
Program Management Support	Var.	Misc.	3,400	0,673	Var.	0,872	Var.	1,019	Var.	CONT.	CONT.		
Subtotal Management			3,400	0,673		0,872		1,019		CONT.	CONT.		
Remarks:													
Total Cost			53,700	9,923		13,598		29,585		CONT.	CONT.		

R-1 SHOPPING LIST - Item No. 170 - 12 of 170 - 12

Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 12 of 12)

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CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification									
DATE: February 2000									
APPROPRIATION/BUDGET ACTIVITY									
R-1 ITEM NOMENCLATURE									
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7									
MK48 ADCAP/0205632N									
COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total PE Cost	16.597	20.314	15.853	17.227	18.406	23.033	30.398	CONT.	CONT.
MK48 ADCAP/V0366	16.597	20.314	15.853	17.227	18.406	23.033	30.398	CONT.	CONT.
Quantity of RDT&E Articles									

A. (U) Mission Description and Budget Item Justification. The MK 48 ADCAP (Advanced CAPability) torpedo R&D program focuses on two specific areas through FY05: Guidance and Control (G&C) software upgrades and wideband sonar capability. The Chief of Naval Operations continues to stress shallow water (less than 600 feet) as a critical operating area to counter third world diesel electric submarines. Torpedo testing in shallow water has demonstrated that in-service ADCAP has less than full capability in this difficult environment. However, this testing, in conjunction with laboratory simulation efforts, has shown that significant performance improvements can be made by implementing changes to weapon tactics and software algorithms. Development, implementation and testing of these changes is being accomplished under the ADCAP G&C software upgrade program.

(U) The focus of the MK 48 ADCAP torpedo R&D program for FY01 and out has shifted from being primarily concentrated on Software Block Upgrade efforts to a coordinated hardware/software upgrade for countering evolving threats and maintaining robust performance. Countermeasure (CM) sophistication and availability on the open market directly affects ADCAP kill proficiency and its ability to counter rapidly evolving threats. The Common Broadband Advanced Sonar System (CBASS) program will develop and field a wideband sonar capable of identifying CMs and discriminating them from the target. CBASS will procure 23 test articles (2 test vehicles, 6 prototypes and 15 Engineering Development Models (EDMs)). CBASS met Milestone II requirements on 6 March 1998 and received MDA approval to proceed into EMD. Full rate production and IOC are scheduled for FY05. The intent of the CBASS program is to achieve a roughly threefold improvement in shallow water torpedo performance over current (MK48 Mod 5) capability.

(U) The introduction of phased prototyping in FY03 will provide a more rapid technology transition path for incremental torpedo improvements and upgrades (including the development and test of New Technology Concepts from the R&D community (6.2/6.3) and contractor Independent Research and Development (IR&D)). This approach will incorporate accelerated in-water testing of the new concepts allowing early Fleet input into future ADCAP upgrades and help to provide the foundation for Next Generation Torpedoes. These efforts will continue torpedo development investment at a lower cost and shorter term than traditional torpedo programs.

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Exhibit R-2, RDT&E Budget Item Justification  
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CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification		DATE:	February 2000
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE		
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	MK48 ADCAP/0205632N		
FY 1999 ACCOMPLISHMENTS:			
<ul style="list-style-type: none"><li>- (U) (\$8.252) Continued the development of G&amp;C Software Block Upgrade IV in preparation for Operational Testing in FY00. Supported FOT&amp;E of Software Block Upgrade III. G&amp;C software efforts continued in order to address fleet identified priorities for MK48 ADCAP MODS. Efforts included software coding, modeling and simulation of proposed releases (including development and validation of models) and engineering tests in water for evaluation of proposed releases. Conducted validation of safety features for submarine crew safety.</li><li>- (U) (\$0.095) Provided for COMOPTEVFOR Block Upgrade IV DT test support.</li><li>- (U) (\$7.937) Completed CBASS trade studies and requirements analysis that initiated design development. Continued development of advanced wideband algorithms, signal processing, and tactical software. Performed wideband data gathering exercises and initiated the fabrication of CBASS test vehicles which will support algorithm development and initial software builds.</li><li>- (U) (\$0.313) Continued to develop, design and prototype new propulsion concepts. Continued land-based testing of alternate fuels and reduced maintenance propulsion components.</li></ul>			

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Exhibit R-2, RDT&E Budget Item Justification  
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EXHIBIT R-2, RDT&E Budget Item Justification		DATE:	February 2000
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE		
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	MK48 ADCAP/0205632N		
FY 2000 PLANS:			
<ul style="list-style-type: none"><li>- (U) (\$6.238) Complete the development of G&amp;C Software Block Upgrade IV in support of OT. Conduct Operational Evaluation of Software Block Upgrade IV. G&amp;C software development efforts continue in order to address fleet identified priorities for MK48 ADCAP MODS. Efforts include software coding, modeling and simulation of software releases (including development and validation of models) and engineering tests in water for evaluation of proposed releases. Conduct validation of safety features for submarine crew safety.</li><li>- (U) (\$0.325) Provide for COMOPTEVFOR Software Block Upgrade IV test support.</li><li>- (U) (\$13.551) Complete CBASS design development and fabrication of prototypes. Continue development of advanced wideband algorithms, signal processing, and tactical software. Procure and manufacture interim test equipment. Initiate integration of prototype hardware and software components and test equipment. Begin in-water testing to support algorithm development and initial software builds.</li><li>- (U) (\$0.200) Continue to develop, design and prototype new propulsion concepts. Continue land-based testing of alternate fuels and reduced maintenance propulsion components.</li></ul>			

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Exhibit R-2, RDT&E Budget Item Justification  
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CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification		DATE:	February 2000
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE		
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	MK48 ADCAP/0205632N		
FY 2001 PLANS:			
- (U) (\$4.484) Conduct efforts required to address Software Block Upgrade IV OPEVAL results and conduct Follow-On Test and Evaluation for Software Block Upgrades III & IV. G&C software development efforts continue in order to address fleet identified priorities for MK48 ADCAP MODS. Efforts include software coding, modeling and simulation of software releases (including development and validation of models) and engineering tests in water for evaluation of proposed releases. Conduct validation of safety features for submarine crew safety.			
- (U) (\$0.100) Provide for COMOPTEVFOR FOT&E test support.			
- (U) (\$11.059) Conduct qualification testing of CBASS prototypes. Continue development of advanced wideband algorithms, signal processing, and tactical software. Continue integration of CBASS prototype hardware and software components and test equipment. Continue in-water testing to support algorithm development and initial software builds.			
- (U) (\$0.210) Continue to develop, design and prototype new propulsion concepts. Continue land-based testing of alternate fuels and reduced maintenance propulsion components. Downselect to best prototype propulsion design.			

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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, page 4 of 8)

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CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification			DATE:	February 2000
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE			
<b>RESEARCH DEVELOPMENT TEST &amp; EVALUATION, NAVY/BA-7</b>	MK48 ADCAP/0205632N			
B. Program Change Summary:				
FY 2000 President's Budget	FY 1999	FY 2000	FY 2001	
Appropriated Value:	17.428	20.426	15.609	
Adjustment to FY 1999/2000 Appropriated Value/	17.550	20.426	0.244	
FY 2000 President's Budget:	-0.953	-0.112		
FY 2001 President's Budget Submit	16.597	20.314	15.853	
Funding:				
FY99: Net reduction of -\$0.953M is due to -\$0.248M general undistributed reductions, -\$0.105 SBIR reduction, and -\$0.600M below threshold reprogramming action by sponsor.				
FY00: Reduction of -\$0.112M due to Issue 67365 undistributed general reduction. \$.208M of the extramural program is reserved for the SBIR assessment IAW 15 USC 638.				
FY01: Net increase of \$0.244M due to \$0.389M Navy Working Capital Fund (NWCFF) rate adjustment increases and -\$0.145M undistributed general reductions.				
Schedule: Due to the CBASS program restructuring the in-water test program has been extended an additional year to supplement software development. This results in a one year extension of developmental testing and a one year shift in Technical and Operational Testing. Operational evaluation concludes in FY04 with an Initial Operational Capability (IOC) in FY05.				
Technical Due to unanticipated design complexities and results from trade study analysis, additional engineering tests are necessary to complete algorithm downseled and software development prior to commencement of in-water developmental testing with prototypes.				
C. Other Program Funding Summary (\$ in millions)			To	
	FY 1999	FY 2000	FY 2001	FY 2002
MK48 ADCAP MODS (WPN/PE0204284N/BA-3/P-1 Item 322500)				
	48.897	45.088	38.926	46.594
			60.107	59.382
				70.982
				CONT.
D. (U) Acquisition Strategy: CBASS EMD contract was competitively awarded among qualified ADCAP producers.				

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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, page 5 of 8)

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EXHIBIT R-2, RDT&E Budget Item Justification		DATE: February 2000
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE	
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7	MK48 ADCAP/0205632N	

E. Schedule Profile:

PROGRAM EFFORTS	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05
Heavyweight Continuous Improvements	BLOCK III - IOC ▲	BLOCK III - FOT&E ▲ BLOCK IV	BLK IV OPEVAL ▽	BLK III/IV FOT&E △	Continuous Softw are Improvements			
CBASS Development			Engineering Tests in Support of CBASS Algorithm and Softw are Development △			DT/OT ▽	OPEVAL △	
	▲ MS II	▲ AWARD EMD CONTRACT				△ Review for LRIP		△ MSIII
Torpedo Technology Improvement - STEP								

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Exhibit R-2, RDT&E Budget Item Justification  
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Exhibit R-3 Cost Analysis (page 1)			DATE:		February 2000							
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT		PROJECT NAME AND NUMBER							
RDT&E, NIBA-7			MK48 ADCAP/0205632N		MK48 ADCAP/V0366							
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NUWC Newport, RI	CONT.	1.849	11/98	1.574	10/99	0.748	10/00	CONT.	CONT.	N/A
Primary Hardware Development	C,CPFF	ARL/PSU State College, PA	CONT.	0.250	01/99	0.000	10/99	0.000	10/00	CONT.	CONT.	N/A
Primary Hardware Development	C,CPFF	Northrop Grumman	2.333	4.769	10/98	7.353		3.460		3.538	21.453	21.453
Ancillary Hardware Development											0.000	
Systems Engineering	WR	NUWC Newport, RI	CONT.	3.047	11/98	2.920	10/99	2.293	10/00	CONT.	CONT.	N/A
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			CONT.	9.915		11.847		6.501		CONT.	CONT.	
Remarks: Total Cost and Target Value of Contract represents adjusted Latest Revised Estimate (currently under negotiation) following completion of design trade studies.												
Development Support Equipment											0.000	
Software Development	WR	NUWC Newport, RI	CONT.	2.296	11/98	1.953	10/99	2.766	10/00	CONT.	CONT.	N/A
Software Development	C,CPFF	ARL/PSU State College, PA	CONT.	0.500	01/99	0.500	10/99	0.548	10/00	CONT.	CONT.	N/A
Training Development											0.000	
Integrated Logistics Support											0.000	
Configuration Management											0.000	
Technical Data											0.000	
GFE											0.000	
Subtotal Support			CONT.	2.796		2.453		3.314		0.000	CONT.	
Remarks:												

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Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 7 of 8)

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Exhibit R-3 Cost Analysis (page 2)			DATE:		February 2000							
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT		PROJECT NAME AND NUMBER							
RDT&E, N/BA-7			MK48 ADCAP/0205632N		MK48 ADCAP/V0366							
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	NUWC Newport, RI	CONT.	2.434	11/98	2.696	10/99	3.886	10/00	CONT.	CONT.	N/A
Developmental	Various	Various	CONT.	0.095	10/98	0.615	10/99	0.196	10/00	CONT.	CONT.	N/A
Modeling & Simulation	WR	NUWC Newport, RI	CONT.	1.050	11/98	2.207	10/99	1.561	10/00	CONT.	CONT.	N/A
Modeling & Simulation	C,CPFF	ARL/PSU State College, PA	CONT.	0.000		0.079	10/99	0.000		CONT.	CONT.	N/A
GFE											0.000	
Subtotal T&E			CONT.	3.579		5.597		5.643		CONT.	CONT.	
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support	Various	Various	CONT.	0.120	MISC.	0.120	MISC.	0.122	MISC.	CONT.	CONT.	N/A
Travel				0.032		0.045		0.045		CONT.	CONT.	N/A
Labor (Research Personnel)											0.000	
Overhead				0.155		0.252		0.228		CONT.	CONT.	N/A
Subtotal Management			CONT.	0.307		0.417		0.395		CONT.	CONT.	
Remarks:												
Total Cost			CONT.	16.597		20.314		15.853		CONT.	CONT.	
Remarks:												

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Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 8 of 8)

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## EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
W0601 Common Ground Equipment	5,513	4,088	3,259	3,410	3,524	3,586	3,720	CONT.	CONT.
W0852 Consolidated Automated Support System (CASS)	8,421	8,523	7,974	8,614	8,754	8,190	8,241	CONT.	CONT.
W1041 Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP)	1,636	894	747	641	640	653	675	CONT.	CONT.
W1355 Aircraft Engine CIP	42,704*	39,495	39,038	38,827	38,593	38,361	38,382	CONT.	CONT.
<b>TOTAL</b>	<b>58,274</b>	<b>53,000</b>	<b>51,018</b>	<b>51,492</b>	<b>51,511</b>	<b>50,790</b>	<b>51,018</b>	<b>CONT.</b>	<b>CONT.</b>

Quantity of RDT&E Articles: Not Applicable

\*The FY 1999 budget reflects a \$2,000 Congressional add for Eddy Current Sensors (executed under project W2663), which has been revised by \$64K for Congressional undistributed adjustments.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Common Ground Equipment is a Naval Aviation Project to apply new technology to common support equipment necessary to support all aircraft. CASS develops standardized Automated Test Equipment (ATE) with computer assisted, multi-function capabilities to support the maintenance of aircraft subsystems and missiles. AERMIP is the only Navy program that provides engineering support for in-service out-of-production aircraft equipment and provides increased readiness at reduced operational and support cost. Aircraft Engine CIP develops reliability and maintainability (R&M) and safety enhancements for in-service Navy aircraft engines, transmission, propellers, starters, auxiliary power units, electrical generating systems, fuel systems, and fuels and lubricants.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing for upgrade of existing operational systems.

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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 1 of 25)

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0205633N**      **PROJECT NUMBER: W0601**  
**PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS**      **PROJECT TITLE: Common Ground Equipment**

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
<b>W0601 COMMON GROUND EQUIPMENT</b>									
<b>TOTAL</b>	<b>5,513</b>	<b>4,088</b>	<b>3,259</b>	<b>3,410</b>	<b>3,524</b>	<b>3,586</b>	<b>3,720</b>	<b>CONT</b>	<b>CONT</b>

Quantity of RDT&E Articles: Not Applicable

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project introduces effective, efficient fleet support equipment through the application of new technology, thereby improving fleet supportability and aircraft readiness.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$2,546) Continued Advanced Boresight Equipment (ABE) development/LRIP program.
- (U) (\$ 563) Continued development of Joint Service Electronic Combat Tester (JSECT).
- (U) (\$ 530) Continued development of USAF Next Generation Munitions Handler (NGMH).
- (U) (\$ 132) Completed development of Automated Engine Turning Tool.
- (U) (\$1,562) Initiated development of the Joint Engine Test Initiative (JETI).
- (U) (\$ 180) Completed testing of Flight Line Electrical Distribution System (FLEDS) and Heat, Gun Programs.

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W0601

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT TITLE: Common Ground Equipment

2. FY 2000 PLAN:

- (U) (\$ 271) Continue ABE development LRIP program.
- (U) (\$ 266) Continue development of USAF NGMH.
- (U) (\$ 554) Complete JSECT.
- (U) (\$2,997) Continue development of JETI

3. FY 2001 PLAN:

- (U) (\$ 380) Continue ABE program.
- (U) (\$ 495) Continue NGMH program.
- (U) (\$1,484) Complete JETI program.
- (U) (\$ 300) Continue new Aircraft Axle Jack Program.
- (U) (\$ 200) Initiate Aviator Breathing Oxygen (ABO) Program.
- (U) (\$ 200) Initiate Composite Material Inspection program.
- (U) (\$ 200) Initiate Non-Destructive Inspection (NDI) Ultrasonics program.

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Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 3 of 25)



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## EXHIBIT R-2a, FY 2001 RDT&amp;E,N BUDGET PROJECT JUSTIFICATION

DATE: February 2000

PROJECT NUMBER: W0601  
PROJECT TITLE: Common Ground EquipmentBUDGET ACTIVITY: 7  
PROGRAM ELEMENT: 0205633N  
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

## (U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	6,141	4,110	3,969
(U) Appropriated Value:	6,341	4,110	
(U) Adjustments from President's Budget	(628)	(22)	(710)
(U) FY 2001 President's Budget Submit:	5,513	4,088	3,259

## CHANGE SUMMARY EXPLANATION:

(U) Funding: FY1999 reflects a \$599 thousand decrease for reprioritization of requirements within the Navy and a \$29 thousand decrease for revised economic assumptions. FY 2000 reflects a \$22 thousand decrease for an Across-the-Board Congressional rescission. FY 2001 reflects a \$666 thousand decrease for reprioritization of requirements within the Navy, a \$57 thousand decrease for Strategic Sourcing Plan Savings, and a \$29 thousand decrease for revised economic assumptions offset by a \$42 thousand increase for Military and Civilian Pay.

(U) Schedule: The FY 1999 contract for the Advanced Boresight Program slipped due to the receipt of only one bid. Additional contractual steps were taken to ensure contract stability; however, the T&E timeframe will be compressed with no affect to the projected milestones. The FY2001 to Complete for Next Generation Munitions Handler was erroneously stated as 12/01(MSIII), which should have been 12/05(MSIII) as Milestone III begins sometime in FY2004.

(U) Technical: Not applicable.

## (U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	<u>FY 1999</u> <u>Actual</u>	<u>FY 2000</u> <u>Budget</u>	<u>FY 2001</u> <u>Estimate</u>	<u>FY 2002</u> <u>Estimate</u>	<u>FY 2003</u> <u>Estimate</u>	<u>FY 2004</u> <u>Estimate</u>	<u>FY 2005</u> <u>Estimate</u>	<u>To</u> <u>Complete</u>
(U) APN-7 (47C2)	101,984	139,450	103,100	117,353	115,498	129,335	202,170	Cont
(U) O&MN	2,970	4,600	4,885	4,954	5,028	4,808	4,940	Cont

Related RDT&E: (U) Not ApplicableR-1 Item No. 172  
UNCLASSIFIEDExhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 4 of 25)

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**EXHIBIT R-2a, FY 2001 RDT&E N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0205633N**      **PROJECT NUMBER: W0601**  
**PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS**      **PROJECT TITLE: Common Ground Equipment**

(U) D. ACQUISITION STRATEGY: This is a non-ACAT program. Field activities propose tentative RDT&E projects. Internal panel merits and selects projects. Field activities develop projects and submit results. Operational Advisory Group (OAG) process selects projects to transition to procurement (APN-7).

**(U) E. SCHEDULE PROFILE**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>	<u>To Complete</u>
(U) Program Milestones				
Automated Engine Turning Tool				
Advanced Boresight Program PM		1/00(MSIII)		12/01(MSIII)
Next Generation Munitions Handler				12/05(MSIII)
FLEDS	9/99(DT)			
(U) Engineering Milestones				
Advanced Boresight Program	8/99 (CDR)			
(U) T&E Milestones				
Automated Engine Turning Tool	2/99 (OT)			
(U) Contract Milestones				
Advanced Boresight Program	4/99 (Contract Award)			
Joint Engine Test Initiative	8/99 (Contract Award)	9/00(MSIII)		

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**Exhibit R-2a, RDT&E Project Justification**  
**(Exhibit R-2a, Page 5 of 25)**

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**EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS**

**DATE: Feb 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0205633N**

**PROJECT NUMBER: W0601**

**PROJECT TITLE: Common Ground Equipment**

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>Total Cost</u>	<u>Target Value of Contract</u>
				<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>		
Hardware Development	C/FP	AAI Corp, Cockeysville, MD	2,760	4,000	1/99					6,760	6,760
	FFP	RACAL San Antonio, TX				2,997	2/00	0		2,997	2,997
Miscellaneous	Various	Various	10,442	1,513	11/98					Cont	Cont

**Subtotal Hardware Development**

**13,202 5,513 2,997**

**Cont**

**Remarks:**

Miscellaneous Support

Various

1,091

2,759

Cont

**Subtotal Support**

**0 0**

**2,759**

**Cont**

**Remarks:**

Miscellaneous Test & Evaluation

Various

500

Cont

**Subtotal Test & Evaluation**

**0 0 0**

**500**

**Cont**

**Remarks:**

**Subtotal Management**

**0 0 0**

**0**

**Remarks:**

**Total Cost**

**13,202 5,513 4,088**

**Cont**

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT NUMBER: W0852

PROJECT TITLE: Consolidated Automated Support System

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
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W0852 Consolidated Automated Support System

<b>TOTAL</b>	8,421	8,523	7,974	8,614	8,754	8,190	8,241	Cont	Cont
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Quantity of RDT&E Articles: Not Applicable

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Consolidated Automated Support System (CASS) project designs and develops modular constructed automated test equipments with computer-assisted, multi-functional capability based, standardized hardware and software elements. CASS responds to Fleet Commanders' expressed requirements to correct serious deficiencies in existing automatic test equipment. Program objectives are: (1) increase material readiness; (2) reduce life cycle costs through standardization; (3) improve tester sustainability at depot and intermediate maintenance levels; (4) reduce proliferation of unique test equipment and (5) provide test capability for existing and future avionics/electronics systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

### 1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$1,000) Continued development of DOD Automated Test System (ATS) standard interfaces and architectures .
- (U) (\$1,377) Continued development of A Board Base Environmental for Test (ABBET) standards instrument control software.
- (U) (\$1,044) Continued CASS station upgrades to include tunable lasers and wide-band focal plan arrays.
- (U) (\$4,000) Continued development of instrument control upgrades and virtual instruments (RT CASS).
- (U) (\$1,000) Continued development of advanced digital/video process.

### 2. FY 2000 PLAN:

- (U) (\$ 563) Continue development of DOD ATS standard interfaces and architectures. (NXTTEST)
- (U) (\$ 177) Continue development of ABBET standards instrument control software.
- (U) (\$ 406) Continue CASS station upgrades to include tunable lasers.

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT NUMBER: W0852

PROJECT TITLE: Consolidated Automated Support System

2. FY 2000 PLAN: (CONT)

- (U) (\$6,919) Continue development of instrument control upgrades and virtual instruments (RT CASS).
- (U) (\$ 458) Continue development of advanced digital/video process.

3. FY 2001 PLAN:

- (U) (\$7,000) Continue development of instrument control upgrades and virtual instruments (RT CASS).
- (U) (\$ 974) Continue CASS station upgrades to include tunable lasers.

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 Presidents Budget:	8,475	8,570	8,819
(U) Appropriated Value:	8,862	8,570	
(U) Adjustments from Presidents Budget:	(54)	(47)	(845)
(U) FY 2001 President's Budget Submit:	8,421	8,523	7,974

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7  
PROGRAM ELEMENT: 0205633N  
PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT NUMBER: W0852  
PROJECT TITLE: Consolidated Automated Support System

### CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1999 reflects a \$14 thousand decrease for reprioritization of requirements within the Navy and a \$40 thousand decrease for revised economic assumptions. FY2000 reflects a \$47 thousand decrease for an Across-the-Board Congressional rescission. FY2001 reflects a \$787 thousand reduction for reprioritization of requirements within the Navy and a \$58 thousand decrease for revised economic assumptions.

(U) Schedule: The FY1999 RTCASS contract was awarded April 1999 and an option was exercised November 1999. There will be no effect to the projected milestones.

(U) Technical: Not Applicable

### (U) C. OTHER PROGRAM FUNDING SUMMARY:

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To
	Actual	Budget	Estimate	Estimate	Estimate	Estimate	Estimate	Complete
(U) APN-7 (47C2)	99,347	95,886	121,695	122,889	123,104	116,846	62,090	Cont

### Related RDT&E :

(U) N/A

(U) D. ACQUISITION STRATEGY: The strategy for Parts Obsolescence is a combined effort with the contractor, any changes to present strategy will add additional risks to achieving a continuous production schedule and will cause technical uncertainty. For new technologies we will have competitive studies to ascertain the market technology, which will result in maximum information for minimum expenditure.

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Exhibit R-2a, RDT&E Project Justification  
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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE:** February 2000

**BUDGET ACTIVITY:** 7

**PROGRAM ELEMENT:** 0205633N  
**PROGRAM ELEMENT TITLE:** AVIATION IMPROVEMENTS

**PROJECT NUMBER:** W0852  
**PROJECT TITLE:** Consolidated Automated Support System

**(U) E. SCHEDULE PROFILE**

(U) Program Milestones  
 RTCASS

(U) Engineering Milestones  
 RTCASS

(U) T&E Milestones  
 RTCASS

(U) Contract Milestones  
 RTCASS

<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>To Complete</u>
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N/A

6/99(FDR)

4/99	11/99
Contract Award	Contract Option

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## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: Feb 2000

### BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W0852

PROJECT TITLE: Consolidated Automated Support System

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>Cost to Complete</u>	<u>Total Cost</u>
				<u>Cost</u>	<u>Award Date</u>	<u>Cost</u>	<u>Award Date</u>	<u>Cost</u>	<u>Award Date</u>		
Pre-Planned Product Improvement (P3I)	FPI	Various	835,000								
P3I	FPI	LMC	12,234	4,000	2/99	6,919	11/99	7,000	1/01	Cont	Cont
P3I	WX	NAWC-AD-LKE	15,539	3,019	12/98	672	12/99	780	12/00	Cont	Cont
P3I	WX	NAWC-AD-PAX	510,200	852	12/98	154	12/99	194	12/00	Cont	Cont
P3I	WX	Various		270	12/98						

### Subtotal Product Development

1,372,973 8141 7,745 7,794 Cont Cont

### Misc

Various Various 280 778 1/99 778 Cont Cont

### Subtotal Support

280 778 0 Cont Cont

### Remarks:

### Subtotal Test & Evaluation

0 0 0 0 0 0 0

### Subtotal Management

0 0 0 0 0 0 0

### Total Cost

1,372,973 8,421 8,523 7,974 Cont Cont

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N  
 PROGRAM ELEMENT TITLE: AVIATION IMPROVMENTS

PROJECT NUMBER: W1041  
 PROJECT TITLE: AIRCRAFT EQUIPMENT  
 RELIABILITY /MAINTAINABILITY IMPROVEMENT  
 PROGRAM (AERMIP)

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
W1041 (AERMIP)	1,636	894	747	641	640	653	675	CONT	CONT
<b>TOTAL</b>	<b>1,636</b>	<b>894</b>	<b>747</b>	<b>641</b>	<b>640</b>	<b>653</b>	<b>675</b>	<b>CONT</b>	<b>CONT</b>

Quantity of RDT&E Articles: Not Applicable

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: AERMIP is the only Navy program, which provides Research, Development, Test & Evaluation (RDT&E) engineering support specifically for in-service, out-of-production aircraft equipment. AERMIP increases readiness through Reliability and Maintainability (R&M) and safety improvements to existing systems and equipment installed in Naval aircraft. It also, provides a transition vehicle to deploy Total Ownership Cost (TOC) reduction initiatives through flight-test support and Fleet Test & Evaluation. It meets affordable readiness objectives by providing a cost-effective solution to obsolescence problems encountered when service lives are extended, and promotes commonality and standardization across aircraft platform lines and among the services through extension of application and use of non-development items. AERMIP also decreases life cycle costs through reduced operational and support costs. AERMIP facilitates the Operational, Safety, and Improvement Program by applying proven low-risk solutions to current fleet problems. AERMIP also funds high priority flight testing which is not associated with any acquisition or development program under the Flight Test General (FTG) task.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$1,636) Completed E2/C2 Cowlings Latch. Received approval to use SKYFLEX on the H60 and F18 aircraft. Continued with SKYFLEX evaluation on the H46, H53, E2/C2, C130, AV-8B, T45, EA6B and F-14, Multi-Place Life Raft Improvement Program, Airborne Air Removal Device program (F-14 application). Extended Replacement Attitude Heading Reference System (RAHRS) application to the EA-6B/E-2C. Initiated MD-1 Gyroscope improvement program. Investigated high value payback return on investment candidates.

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Exhibit R-2a, RDT&E Project Justification  
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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: FEBRUARY 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0205633N**

**PROGRAM ELEMENT TITLE: AVIATION IMPROVMENTS**

**PROJECT NUMBER: W1041**

**PROJECT TITLE: AIRCRAFT EQUIPMENT**

**RELIABILITY /MAINTAINABILITY IMPROVEMENT  
PROGRAM (AERMIP)**

**2. FY 2000 PLAN:**

- (U) (\$894) Complete multi-platform application of SKYFLEX with approval for use on all platforms. Complete Airborne Air Removal Device (EA-6B application), and Multi-Place Life Raft Improvement Program. Continue with the extension of application of the RAHRS for the EA-6B/E-2C. Conduct AN/ARC-161 Improvement Program. Investigate high value pay back return on investment candidates.

**3. FY 2001 PLAN:**

- (U) (\$747) Transition Total Ownership Cost reduction corrosion initiatives and extension of RAHRS application for the EA-6B/E-2C. Initiate the replacement Inner Communication System (ICS) program. Investigate high value return on investment candidates and transition of TOC reduction initiatives.

**(U) B. PROGRAM CHANGE SUMMARY**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	1,315	899	769
(U) Appropriated Value:	1,351	899	
(U) Adjustments from President's Budget:	+321	-5	-22
(U) FY 2001 President's Budget Submit:	1,636	894	747

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: AVIATION IMPROVMENTS

PROJECT NUMBER: W1041

PROJECT TITLE: AIRCRAFT EQUIPMENT  
RELIABILITY /MAINTAINABILITY IMPROVEMENT  
PROGRAM (AERMIP)

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 net increase of \$321 thousand reflects an increase of \$204 thousand for the fleet engineering team and an increase of \$132 thousand for Laser Eye offset by a decrease of \$6 thousand for inflation savings, a decrease of \$6 thousand for Small Business Innovative Research (SBIR) assessments, and a decrease of \$3 thousand for payment of lapsed liability contracts. The FY 2000 decrease reflects a \$5 thousand decrease for an Across-the Board rescission. The FY 2001 net decrease of \$22 thousand reflects a decrease of \$16 thousand for Aircraft Maintenance Work, a decrease of \$3 thousand for minor economic adjustments, a decrease of \$2 thousand for reprioritization of requirements within the Navy, a decrease of \$6 thousand for revised economic adjustments, a decrease of \$5 thousand for Strategic Sourcing Plan savings offset by an increase of \$10 thousand for Navy Working Capital Fund (NWCF) adjustments.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY: Not applicable

(U) D. ACQUISITION STRATEGY: This is a non-ACAT program with no specific acquisition strategies.

(U) E. SCHEDULE PROFILE: Not applicable

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Exhibit R-2a, RDT&E Project Justification  
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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT NUMBER: W1355

PROJECT TITLE: AIRCRAFT ENGINE CIP

(U ) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
W1355 Aircraft Engine CIP									
TOTAL	42,704*	39,495	39,038	38,827	38,593	38,361	38,382	CONT.	CONT.

Quantity of RDT&E Articles: Not applicable

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Aircraft Engine CIP provides the only source of critical design and development engineering support to resolve safety, reliability and maintainability deficiencies of in-service Navy aircraft propulsion systems. The highest priority issues CIP addresses concern safety-of-flight deficiencies which account for approximately 80% of CIP efforts. The program also corrects service-revealed deficiencies, improves Operational Readiness (OR) and Reliability and Maintainability (R&M), and reduces platform Life Cycle Cost (LCC). Budgets are allocated across platform-specific teams and multi-platform product support teams based upon long term strategies to achieve safety and affordable readiness goals; the R-3 exhibit details annual portions of those long-term plans. CIP tasks have reduced the rate of in-flight aborts, safety incidents, non-mission capable rates, scheduled and unscheduled engine removals, maintenance work hours, and overall cost of ownership. This is accomplished through the maintenance and validation of specification performance, testing to qualify engineering changes, verifying life limits, and improving the inherent reliability of the propulsion system as an integral part of Reliability Centered Maintenance (RCM) initiatives. Historically, the missions, tactics, and environmental exposure of military aircraft systems change to meet new threats or operational demands, and often result in unforeseen problems, which if not corrected, can cause critical safety/readiness degradation, such as those experienced during DESERT SHIELD/DESERT STORM operations due to sand erosion. In addition, new problems arise through actual use during deployment of the aircraft. Development programs, while geared to resolve as many problems as possible before deployment, cannot duplicate actual operations or account for the vast array of environmental and usage variables, particularly when aircraft missions vary from those the aircraft was designed to perform. Therefore, it has been found that CIP can provide an immediate engineering response to these flight-critical problems and accelerated engine testing can avoid potential problems. CIP starts after development and Navy acceptance of the first production article and addresses usage and life problems not covered by warranties. CIP addresses engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, and fuel and lubricant systems. CIP efforts continue over the system's life, gradually decreasing to a minimum level sufficient to maintain the reliability, and decrease the operating costs, of older inventory. CIP is a highly leveraged and cooperative tri-service program with Foreign Military Sales participation.

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Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 15 of 25)

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0205633N**

**PROJECT NUMBER: W1355**

**PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS**

**PROJECT TITLE: AIRCRAFT ENGINE CIP**

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

**1. FY 1999 ACCOMPLISHMENTS:**

- (U) (\$38,071) Platform-specific efforts.
- T56 engine (P-3, E-2, C-2, C-130) Digital Engine Analyzer Unit (DETC/EAU) flight test completed, Series II/IV Engine tests completed, Series IV Cost Reduction Initiatives identified, Series III module bridge contract successful.
- Propeller Completed first series of P-3 full scale blade fatigue specimens, submitted ECP for C-130 dual-bearing prop governor, and completed phase I Helicopter Integrated Prognostics Support System(HIPSS) test, feasible for P-3 and C-130 applications.
- S-3 Safety related T5 amplifier redesign and qualification testing completed. Completed lubrication system hardware improvements qualification testing. Completed safety related High Pressure Turbine Life (HPT) limit analysis and implementation. Started safety related Low Pressure Turbine (LPT) life limit analysis and implementation. Completed safety related Silverless HPT configuration development., Completed safety related fan disk titanium hard alpha risk assessment.
- F/A-18C/D Identified root cause of 1<sup>st</sup> Stage Fan blade cracking/failure problem and developed control schedule changes to fix this safety issue. Developed Improved Oil Pressure Transmitter Bracket to eliminate false oil pressure cautions, a safety issue. Developed Main Fuel Control Ratio Piston redesign to eliminate Engine Rollback/Flameout problem that was a safety issue. Developed Improved Handling & Maintenance Procedures to Reduce Engine Removals for High Oil Consumption.
- F-14B/D Completed Accelerated Mission Endurance Testing on seven reliability improvement design changes as well as JP8 +100 fuel. Completed Age Exploration (AE) of high time Main Engine Controls (MEC), AE program resulted in a 50% increase in MEC life limit. Collected and processed data from over 600 F-14B and F-14D flights for update of F-14B/D mission analysis and F110-GE-400 engine life limits. Completed High Pressure Turbine (HPT) Forward Shaft rework qualification, which allows HPT shaft to be reworked vice thrown away at its scheduled life limit. Completed T4B Pyrometer redesign.
- Mature Aircraft (EA-6B, T-2) Completed disassembly and evaluation of test engine. Performed Low Pressure Compressor analysis for Stall Improvements. Developed Turbine Brush Seals for evaluation in FY00 Test Engine. Completed verification of new design Turbine Exhaust Case Power Plant Change.
- H-2/H-60 Reduced H-60 power loss and flameouts, a critical safety issue. Analyzed and implemented new life management issues affecting safety and affordability. Identified source of Power Take-off (PT) Shaft Rubs causing high rejection rate. Improved diagnostics and troubleshooting capability. Reduced rejection of serviceable equipment for the top 2 engine level degraders.
- AV-8B Completed design effort and qualification tests for new Inlet Guide Vane Control System (IGVCS), a safety related problem that has led to aircraft mishaps. Completed engineering analyses and risk assessment of multiple quality deficient engine components that failed in the Fleet including Fuel Metering Unit relay shaft and intermediate cause bearing housings, all safety related issues. Acquired over 700-mission profile tapes to analyze data for life management of critical engine components. Completed development of Phase I software for engine monitoring system upgrade.

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT NUMBER: W1355

PROJECT TITLE: AIRCRAFT ENGINE CIP

1. FY 1999 ACCOMPLISHMENTS: (CONT)

- H-53/H-46/H-3 Data reduction program delivered and installed. Reworked Power Take-off alternator conduit seal joint issue. Updated all rotating parts lives, a safety issue. Completed Erosion resistant Airfoil testing. Redesignated safety Anti-Leak check valve Interim Power Plant Change (IPPC).
- H-1 Improved ignition cable assembly, improved No. 3 Bearing Pressure Oil Tube Assembly, and improved Air Inlet Screen. Re-established the Component Improvement Program with Pratt and Whitney Canada.
- T-45 Conducted prototype testing for solutions to engine surges, a critical safety issue. Developed new test cell thrust measurement methodology. Submitted Recommended Redesign for compressor High Cycle Fatigue (HCF) failures, a safety issue. Conducted test and analysis to support life extension for most expensive parts (Low Pressure Turbine Disks, Combustor Cases, Turbine Shafts).
- V-22 Completed brush seal backdrive vendor study. Started AE1107C Life Management Master Plan. Vibration Structural Life Engine Diagnostics (VSLED) and Aircraft Maintenance Engineering Ground Station (AMEGS) program support. Started the Propeller Gearbox (PRGB) Non-magnetic detector program to correct a safety issue.
- F/A-18E/F. Investigated compressor blisk tip cracking, engine stalls and stator fatigue. Instrumented compressor engine test. Gathered data from test to be used in redesign efforts. Developed Full Authorized Digital Electronic Control (FADEC) Software re-programming and developed interim solutions for blisk tip cracking and stall.
- (U) (\$4,633) Multi-Platform Product Support Published NAVAIRINST 10350.4A which provides technical information and guidance to the fleet on the handling and use of propulsion lubricants. Published service problem investigation reports. Completed full MIL-PRF-23699F qualification testing of one new High Thermal Stability Oil and one new Corrosion Inhibited candidate formulation. Completed requalification testing of one Standard grade oil. Completed revisions to SAE aviation piston engine oil standards J1899 and J1966 and the associated military Qualification Products Lists. Provided operational resolution of the AV-8B, F402-RR-406 fuel incompatibility problem. Reported on the preliminary investigation into the shipboard implementation of the +100 fuel thermal stability-improving additive. Conducted a shipboard evaluation of a +100 additive detection kit. Held NATOPS conference and published the revised Aircraft Refueling Handbook. Investigated and resolved over 40 fuel related fleet service problems. Developed modeling and simulation capabilities, acquired tools and training to model and simulate fuel systems, initiated (V-22) fuel system model development and developed improved engine control simulation capability. Re-designed, reviewed, and evaluated TH-6B helicopter fuel system quantity indication system. Advanced the use of aircraft monitoring systems to assess and monitor engine health and track engine parts lives using actual engine data in order to maximize parts life, system reliability, maintainability, and safety.

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT NUMBER: W1355

PROJECT TITLE: AIRCRAFT ENGINE CIP

2. FY 2000 PLAN:

- (U) (\$35,150) Platform-specific efforts.
- I-56 engine (P-3, E-2, C-2, C-130) Maintain safety margins by investigating turbine coatings and develop new designs, continue propeller integration efforts with potential propeller designs, perform engine hot section corrosion and fatigue analysis, and continue bearing improvements.
- E-2/C-2/C-130 Continue propeller safety improvement program, initiate pump housing improvement, perform Hub Internal Supply System development, eliminate starter failures, continue generator improvement program to triple durability.
- S-3 Establish and implement an engineering plan to improve TF34 reliability, perform analysis to obtain better performance from existing hardware, redesign low reliability parts, conduct control system reliability and maintainability analysis, validate and implement recommended part life changes.
- F/A-18C/D Identify obsolescence problems, continue efforts on aft cooling plate, low pressure turbine nozzle and fan stage 3 shroud redesigns. Continue life management issues including the fleet leader program, engine analysis studies, and improved analytical models, analyze engine performance data and update mission analysis.
- Mature Aircraft Address the top readiness degraders and Aviation Depot Logistic Repair (AVDLR) costs; implement efforts on the J52 engine (EA-6B) ASMET test, correct deficiencies in #3 hub, continue to study and implement solutions to "tired iron" issues and future obsolescence problems.
- H-2/H-60 Implement I-level screening techniques for the Digital Electronic Control Unit (DECU) and Hydro-Mechanical units, continue the Advanced Helicopter Transmission Lubricant Program, extend transmission component lives, increase readiness by reducing corrosion, continue Mission Profile Data Collection and Dynamic Component Life Limit efforts.
- AV-8B Address top readiness degraders and AVDLR costs; safety of flight issues, engine removal drivers, and mission failure drivers, assess life management program issues for engine components.
- H-53/H-46/H-3 Continue efforts on the top cause for engine removals; complete transition of program to reliability-centered maintenance; implement goals at depot level to improve compressor performance and engine power, resolve oil consumption and leakage problems, and improve on wing times.
- H-1 Address top safety concerns as ranked by the Operational Advisory Group (OAG) and System Safety Working Group, update Navy maintenance manuals, continue to improve time-between-overhaul and reduce impact of high-time parts, continue improvements on tail rotor drive system.
- I-45 Complete four year engine surge recovery program, address platform safety, increase predicted part life confidence, provide mission profile updates and life cycle management.
- F-14A Perform minimal level of sustaining engineering to address safety-of-flight issues.
- F-14B/D Address extension of component life and the reduction of maintenance hours, improve propulsion system safety through an active life management program for critical rotating components, reduce the engine Non-recoverable In-Flight Shutdown Rate by 75% by 2003, reduce the propulsion system related mission abort rate by 50% by 2003.
- F/A-18E/F and V-22 Continue initiation of CIP programs addressing propulsion systems such as electrical and fuel systems not covered by Power by the Hour programs and other support programs. Address durability improvements identified during qualification testing, continue the life cycle management program, continue "lead the fleet" testing to identify potential deficiencies prior to manifestation in fleet.

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### EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS

PROJECT NUMBER: W1355

PROJECT TITLE: AIRCRAFT ENGINE CIP

2. FY 2000 PLAN: (CONT)

- (U) (\$4,345) Multi-Platform Product Support Teams Continue projects designed to provide common support to multiple platforms in the areas of improved drive systems, secondary power and mechanical systems; improved tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improved products and processes for fuels, lubricants, and refueling equipment; improved blade and vane repair processes and life cycle support; and improved electrical system product support and battery systems.

3. FY 2001 PLAN:

- (U) (\$34,828) Platform-specific efforts.
- T56 engine (P-3, E-2, C-2, C-130) Begin and implement the Engine Monitor System version 7.0 upgrade. Maintain safety margins by investigating turbine coatings and develop new designs, continue propeller integration efforts with potential propeller designs, perform engine hot section corrosion and fatigue analysis, and continue bearing improvements.
- E-2/C-2/C-130 Begin incorporation of improved blade heaters. Begin development of improved propeller control system.
- S-3 Complete new fan blade design. Complete safety related fan High Pressure Compressor (HPC) life limit analysis. Complete Main Fuel Control (MFC) durability investigation. Perform analyses on commercial hardware incorporation analyses. Continue validation and implementation on recommended part life changes.
- F/A-18C/D Identify obsolescence problems, continue efforts on bushing, aft cooling plate, low pressure turbine nozzle and bolted dome combustor redesign efforts. Continue life management issues including the fleet leader program, engine analysis studies, and improved analytical models, analyze engine performance data and update mission analysis.
- Mature Aircraft Address the top readiness degraders and AVDLR costs; implement efforts on the J52 engine (EA-6B) ASMET test, perform annual maintenance awareness brief and annual P-408A major engine inspection program. Continue to study and implement solutions to "tired iron" issues and future obsolescence problems. Begin redesign of diffuser case for increased life.
- H-2/H-60 Complete integrating of the improved Digital Electronic Control Unit (DECU) to the H-60 fleet. Complete implementation of I-level screening techniques for the DECU and Hydro-Mechanical units, continue the Advanced Helicopter Transmission Lubricant Program, extend transmission component lives, increase readiness by reducing corrosion, continue Mission Profile Data Collection and Dynamic Component Life Limit efforts. Continue time on wing and Mean Time Between Removals (MTBR) cost drivers initiatives including compressor durability, Titanium Nitrates (TiN) coating and three-stage turbine.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0205633N**

**PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS**

**PROJECT NUMBER: W1355**

**PROJECT TITLE: AIRCRAFT ENGINE CIP**

**3. FY 2001 PLAN: (CONT)**

- AV-8B Complete design efforts associated with the exhaust duct cracking, and failure of the Low Pressure Compressor (LPC) and HPT blade cracking and shaft sulfidation. Complete Shell Deer Park fuel burner rig testing to eliminate all risk associated with fuel incompatibility in the F402 engines. Address top readiness degraders and AVDLR costs; safety of flight issues, engine removal drivers, and mission failure drivers, assess life management program issues for engine components.
- H-53/H-46/H-3 Start Bleed Valve redesign. Continue efforts on the top cause for engine removals; complete transition of program to reliability-centered maintenance; implement goals at depot level to improve compressor performance and engine power, resolve oil consumption and leakage problems, and improve on wing times.
- H-1 Address top safety concerns as ranked by the OAG and System Safety Working Group, continue to update Navy maintenance manuals, continue to improve time-between-overhaul and reduce impact of high-time parts. Continue improvement program to the Bleed Valve, T5 Harness, Gas Generator Case Diffuser Inlet, and Compressor Stub Shaft. Initiate development of environmentally friendly repairs such as High Velocity OXY fuel coatings to replace chrome and nickel plate repairs.
- T-45 Continue investigation of engine vibration problems to resolve safety issue. Address platform safety, increase predicted part life confidence, provide mission profile updates and life cycle management. Continue Critical Parts Life management to ensure no overfly of parts, continue life management to double most expensive parts life, and address obsolescence issues.
- F-14B/D Complete final life limit updates for F110-GE-400 engine. Complete High Pressure Compressor Spool life improve redesign. Address extension of component life and the reduction of maintenance hours. Continue improvements to propulsion system safety through an active life management program for critical rotating components, reduce the engine Non-recoverable In-Flight Shutdown Rate by 75% by 2003, reduce the propulsion system related mission abort rate by 50% by 2003.
- F/A-E/F Continue analysis of new design using tools validated by test data and fatigue resolutions. Conduct instrumented engine test for tip cracks, stall, and stator. Begin Anti-Ice System Reliability improvements. Investigate afterburner spraybar flex fuel line durability safety issues. . Address durability improvements identified during qualification testing, continue the life cycle management program, continue "lead the fleet" testing to identify potential deficiencies prior to manifestation in fleet.
- V-22 Initiate redesign of Non-magnetic Debris Detector a safety item. Initiate redesign of Integral Spindle Drive ShaftAddress durability improvements identified during qualification testing. Continue the life cycle management program and "lead the fleet" testing to identify potential deficiencies prior to manifestation in fleet.
- (U) (\$4,210) Multi-Platform Product Support Teams Continue projects designed to provide common support to multiple platforms in the areas of improved drive systems, secondary power and mechanical systems; improved tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improved products and processes for fuels, lubricants, and refueling equipment; improved blade and vane repair processes and life cycle support; and improved electrical system product support and battery systems.

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**Exhibit R-2a, RDT&E Project Justification  
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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W1355

PROJECT TITLE: AIRCRAFT ENGINE CIP

### (U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>
(U) FY 2000 President's Budget:	46,167	39,714	47,526
(U) Appropriated Value:	47,402	39,714	
(U) Adjustments from President's Budget:	-3,463	-219	-8,488
(U) FY 2001 President's Budget Submit:	42,704	39,495	39,038

### CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 net decrease of \$3,463 thousand reflects a decrease of \$895 thousand for Small Business Innovative Research (SBIR) assessments, a decrease of \$1,116 thousand for Smart Work/TOC Initiatives, a decrease of \$1,322 thousand for a reprioritization of requirements within the Navy, and a decrease of \$214 thousand for Inflation Savings offset by an increase of \$84 thousand for minor economic adjustments. The FY 2000 decrease reflects a \$219 thousand decrease for an Across-the-Board Congressional rescission. The FY 2001 net decrease of \$8,488 thousand reflects a decrease of \$144 thousand for minor economic adjustments, a decrease of \$365 thousand for Strategic Sourcing Plan savings, a decrease of \$275 thousand for revised economic assumptions, and a decrease of \$7902 thousand for reprioritization of requirements within the Navy offset by an increase of \$137 thousand for Navy Working Capital Fund (NWCFF) adjustments and an increase of \$61 thousand for Military and Civilian Pay.

(U) Schedule: Deferral of Lead the Fleet efforts including analytical condition inspections, service evaluations, and threshold sampling. Reduce scope of FY99 H-1 efforts to eliminate analysis of top readiness degraders and high-time parts which support goal of improving time-between-overhaul; defer portion of tail rotor drive system improvements with completion of effort in FY02 versus FY01. F-18 E/F and V-22 CIP efforts to address propulsion system integration issues uncovered during the flight test programs and establish methodologies for core program metrics have been delayed. Impact on Reliability and Maintainability efforts such as deferral of plans for product improvements, designs to increase time on wing, reduce mean time between failure, and reduce operating and support costs.

(U) Technical: Increase aircraft flight safety risk for the F-18 E/F and V-22 during Operational Evaluation. Increase overall production retrofit costs for needed improvements. Cannot expand evaluation and verifications of redesigns due to deferral of efforts and delays and elimination of R&M projects. Cannot fully explore affordable readiness or properly document lessons learned and realize reliability growth.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0205633N**

**PROGRAM ELEMENT TITLE: AVIATION IMPROVEMENTS**

**PROJECT NUMBER: W1355**

**PROJECT TITLE: AIRCRAFT ENGINE CIP**

(U) C. OTHER PROGRAM FUNDING SUMMARY: Not applicable.

Related RDT&E

(U) P.E. 0203752A (Aircraft Engine CIP Army)

(U) P.E. 0207268F (Aircraft Engine CIP Air Force)

(U) P.E. 0603217N (Aircraft System Advance Tech. Dev.)

(U) D. ACQUISITION STRATEGY: Not applicable

(U) E. SCHEDULE PROFILE: Not Applicable

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**Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 22 of 25)**

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## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

### BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

DATE: February 2000

PROJECT NUMBER: W1355  
PROJECT TITLE: AIRCRAFT ENGINE CIP

Contract Method & Type Performing Activity & Location Total Prior Yrs FY 1999 Award FY 2000 Award FY 2000 Cost FY 1999 Cost FY 2000 Cost FY 2001 Award FY 2001 Cost FY 2001 Complete Total Cost Target Value of Contract

Cost Categories:

### PRODUCT DEVELOPMENT

#### MAJOR EFFORTS (\$1.0M OR MORE)

F110 Engine Program  
GE F3365797C0016  
Award Fees

SS/CPAF Ohio 8,186 2,200 (220) 12/98 2,400 (240) 12/99 2,100 (210) 12/00 CONT. CONT.

F402 ENGINE PROGRAM  
N0001996C0172 RR  
N0001996C0134 UK  
N0001999C0010  
Award Fees

SS/CPAF BRISTOL ENG 6,453 2,000 1/99 1,805 12/99 CONT.  
SS/CPFF BRISTOL ENG 5,497 1,990 1/99 1,750 12/99 CONT.  
SS/CPFF BRISTOL ENG 0 (160) 12/00 3,000 (240) CONT.

F404/T58/T64 ENGINE PROGRAM  
N0001998C0007 GE  
TBD

SS/CPFF LYNN MA 5,333 8,800 10/98 7,040 10/99 7,000 11/00 CONT. CONT.

J52 ENGINE PROGRAM  
N0001998C0054 P&W  
TBD

SS/CPFF FL 1,901 2,010 11/98 2,800 11/99 2,000 12/00 CONT. CONT.

T56 ENGINE  
F4160898C0551

SS/CPFF INDIANA 0 1,670 1/99 1,905 1/00 1,600 2/01 CONT. CONT.

F405 ENGINE PROGRAM  
N0001997C0112 RR  
N0001999C0010  
Award Fees

SS/CPAF BRISTOL ENG 1,900 1,440 (115) 1/99 1,204 (96) 12/99 2,000 (160) CONT. CONT. CONT.

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## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W1355

PROJECT TITLE: AIRCRAFT ENGINE CIP

<u>Cost Categories:</u>	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY2001 Cost	FY2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
F/A 18 E/F PROPULSION PROGRAM N0001998C0007	SS/CPFF	LYNN MA	0	664	3/99	1,401	10/99	680	11/00	CONT.	CONT.	
T700 ENGINE PROGRAM DAAJ0997C0131 GE	SS/CPFF	LYNN MA	1,092	1,000	12/98	1,000	12/99	1,000	1/01	CONT.	CONT.	
TF34 ENGINE PGROGRAM F1460895C1461 GE	SS/CPFF	LYNN MA	2,420	700	10/98	720	10/99	600	11/00	CONT.	CONT.	
V22 PROPULSION PROGRAM N0001999G1048	SS/CPFF	LYNN MA	0	1,000	3/99	1,267	12/99	725	12/00	CONT.	CONT.	
PROPS PROGRAM NAVAIR CONTRACT HAM STANDARD	SS/CPFF		0	1,895	11/98	1,500	10/99	1,000	12/00	CONT.	CONT.	
CONTRACTS UNDER \$1.0M . AGGREGATE TOTAL	VARIOUS	VARIOUS	9,159	1,000	10/98	500	10/99	1,107	10/00	CONT.	CONT.	
LAB/FIELD ACTIVITY (\$1.0M OR MORE)	WX	NAWCAD PAX	60,650	13,759	10/98	12,129	10/99	14,276	10/00	CONT.	CONT.	
OTHER IN HOUSE SUPT <\$1.0M	VARIOUS	VARIOUS	11,946	1,014	10/98	780	10/99	750	10/00	CONT.	CONT.	
GFP FUEL MD INCREMENTAL			2,885	460	10/98	350	10/99	300	10/00	CONT.	CONT.	
<b>Subtotal Product Development</b>			<b>117,122</b>	<b>41,602</b>		<b>38,551</b>		<b>38,138</b>		<b>CONT.</b>	<b>CONT.</b>	

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## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

### BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205633N

PROJECT NUMBER: W1355  
PROJECT TITLE: AIRCRAFT ENGINE CIP

Remarks  
Percent of award fee that was actually  
awarded in PY was 97%.

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY2001 Cost	FY2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
SUPPORT												
OTHER IN HOUSE SUPPORT <\$1.0M			1,747	750	10/98	649	10/99	650	10/00	CONT.	CONT.	
Subtotal Support			1,747	750		649		650		CONT.	CONT.	
Remarks												
TEST AND EVALUATION												
OTHER IN HOUSE <\$1.0M												
AGGREGATE TOTAL	VARIOUS	VARIOUS	2,144	150	10/98	100	10/99	150	10/00	CONT.	CONT.	
Subtotal Test & Evaluation			2,144	150		100		150		CONT.	CONT.	
Remarks												
MANAGEMENT												
OTHER IN HOUSE <\$1.0M	VARIOUS	VARIOUS	0	202	10/98	195	10/99	100	10/00	CONT.	CONT.	
Subtotal Management			0	202		195		100		CONT.	CONT.	
Remarks												
Total Cost			121,013	42,704		39,495		39,038		CONT.	CONT.	

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Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, Page 25 of 25)

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**EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 07**

**PROGRAM ELEMENT: 0205667N**

**PROGRAM ELEMENT TITLE: F-14 Upgrade**

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Budget</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
E1408 F-14 Upgrade	12,249	1,383	1,228	1,503	1,568	1,574	1,610	0	1,837,135
<b>TOTAL</b>	<b>12,249</b>	<b>1,383</b>	<b>1,228</b>	<b>1,503</b>	<b>1,568</b>	<b>1,574</b>	<b>1,610</b>	<b>0</b>	<b>1,837,135</b>

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element provides for the development of improvements to the Navy F-14 squadrons in order to counter the projected threat through the year 2000 and beyond. The F-14D has increased capability in three major areas: new engine, new digital avionics, and upgraded radar. These changes yield significant improvements in capability and performance, as well as reliability and maintainability, and will facilitate the total integration and exploitation of related programs i.e., Joint Tactical Information Distribution System (JTIDS), Infrared Search and Track System (IRST), and inclusion of Airborne Self-Protection Jammer (ASPJ) in the electronic warfare (EW) suite for the F-14D operational evaluation. A Pre-deployment Update (PDU) program (primarily software) includes air-to-ground ordnance delivery capability, full Link 16 capability, and radar/Electronic Counter-Countermeasures (ECCM) improvements for the F-14D. The PDU program was created because of concurrent development of the F-14D and the above listed common avionics and weapons. It implements the capabilities inherent in systems incorporated during the full scale development (FSD) program and is a planned integral part of the evolution of the F-14D aircraft. F-14 weapons integration supports integration of EW improvements and correction of OPEVAL deficiencies. Funding is also provided for various software upgrades such as Global Positioning System, and accommodates the realignment of Aviation Depot Level Repairables (AVDLR) from Major Range and Test Facility Bases to direct project funding.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 07**

**PROGRAM ELEMENT: 0205667N**

**PROJECT NUMBER: E1408**

**PROGRAM ELEMENT TITLE: F-14 Upgrade**

**PROJECT TITLE: F-14 Upgrade**

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Budget</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
E1408 F-14 Upgrade	12,249	1,383	1,228	1,503	1,568	1,574	1,610	0	1,837,135
<b>TOTAL</b>	<b>12,249</b>	<b>1,383</b>	<b>1,228</b>	<b>1,503</b>	<b>1,568</b>	<b>1,574</b>	<b>1,610</b>	<b>0</b>	<b>1,837,135</b>

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element provides for the development of improvements to the Navy F-14 squadrons in order to counter the projected threat through the year 2000 and beyond. The F-14D has increased capability in three major areas: new engine, new digital avionics, and upgraded radar. These changes yield significant improvements in capability and performance, as well as reliability and maintainability, and will facilitate the total integration and exploitation of related programs i.e., Joint Tactical Information Distribution System (JTIDS), Infrared Search and Track System (IRST), and inclusion of Airborne Self-Protection Jammer (ASPJ) in the electronic warfare (EW) suite for the F-14D operational evaluation. A Pre-deployment Update (PDU) program (primarily software) includes air-to-ground ordnance delivery capability, full Link 16 capability, and radar/Electronic Counter-Countermeasures (ECCM) improvements for the F-14D. The PDU program was created because of concurrent development of the F-14D and the above listed common avionics and weapons. It implements the capabilities inherent in systems incorporated during the full scale development (FSD) program and is a planned integral part of the evolution of the F-14D aircraft. F-14 weapons integration supports integration of EW improvements and correction of OPEVAL deficiencies. Funding is also provided for various software upgrades such as Global Positioning System, and accommodates the realignment of Aviation Depot Level Repairables (AVDLR) from Major Range and Test Facility Bases to direct project funding.

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

1. (U) FY 1999 PLAN:
  - (U) (\$12,249) Continued development and test of third PDU tape.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 07**                      **PROGRAM ELEMENT: 0205667N**                      **PROJECT NUMBER: E1408**  
**PROGRAM ELEMENT TITLE: F-14 Upgrade**                      **PROJECT TITLE: F-14 Upgrade**

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

- 2. (U) FY 2000 PLAN:
  - (U) (\$1,383) Complete development and test of third PDU tape. Conduct operational evaluation.
- 3. (U) FY 2001 PLAN:
  - (U) (\$1,228) Procure Aviation Depot Level Repairables (AVDLR) for testing of aircraft.

**B. (U) PROGRAM CHANGE SUMMARY:**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	12,834	1,390	1,472
(U) Appropriated Value:	12,947	1,390	
(U) Adjustments from FY 2000 President's Budget:	-585	-7	-244
(U) FY 2001 President's Budget Submit:	12,249	1,383	1,228

**(U) CHANGE SUMMARY EXPLANATION:**

- (U) Funding:
- (U) The FY 1999 decrease is due to minor pricing and inflation adjustments.
  - (U) The FY 2000 decrease is due to the Across-the-Board Congressional rescission.
  - (U) The FY 2001 decrease is due to minor pricing and inflation adjustments.
- (U) Schedule: (U) A funding reduction in FY99 resulted in a slip in Tape D03B to FY 2000 .
- (U) Technical: N/A

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 07**      **PROGRAM ELEMENT: 0205667N**      **PROJECT NUMBER: E1408**  
**PROGRAM ELEMENT TITLE: F-14 Upgrade**      **PROJECT TITLE: F-14 Upgrade**

**C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in millions)**

APPN	FY 1999 BUDGET	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE
APN-5	209.4	82.8	30.5	4.7	3.6	0	0

(U) RELATED RDT&E:  
 (U) PE 0205604N (Tactical Data Links)  
 (U) PE 0604270N (EW Development)

**D. (U) ACQUISITION STRATEGY: NOT APPLICABLE.**

**E. (U) SCHEDULE PROFILE:**

Program Milestones	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Engineering Milestones			
T&E Milestones		1Q/00 - 2Q/00 OT-III(Tape 3B)	
Contract Milestones			

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**EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS**

**DATE:** February 2000

**BUDGET ACTIVITY:** 07

**PROGRAM ELEMENT:**

0205667N

**PROJECT NUMBER:** E1408  
**PROJECT TITLE:** F14 UPRD

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>FY 2001</u>		<u>Target Value of Contract</u>
				<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>	<u>Complete</u>	<u>Cost</u>	
AMRAAM Int.	SS/CPFF	Northrop Grumman, Bethpage NY	9,924	0		0		0		0	9,924	9,924
BLK I/JDAM	SS/CPFF	Northrop Grumman	6,506	0		0		0		0	6,506	6,506
FSD Cont	SS/FFP	Bethpage, NY	994,378	0		0		0		0	994,378	994,378
PDU	WX	Northrop Grumman	208,241	11,743	12/2/98	0		0		0	219,984	
		Bethpage, NY NAWC Pt. Mugu CA										
Miscellaneous - Contracts			3,154	0		0		0		0	3,154	3,154
Miscellaneous - In House			26,300	350	11/5/98	0		0		0	26,650	
Repair of Repairables	WX	Various	11,078	0		0		0		0	11,078	
<b>Subtotal Product Development</b>			<b>1,259,581</b>	<b>12,093</b>		<b>0</b>		<b>0</b>		<b>0</b>	<b>1,271,674</b>	

Remarks

**Subtotal Support**

**0      0      0      0      0      0      0      0      0      0      0      0**

Remarks

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## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0205667N

PROJECT NUMBER: E1408  
PROJECT TITLE: F14 UPRD

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
PDU Systems Engineering/Test and Evaluation	WX	NAWC Pt. Mugu CA	0	0		1,383	2/00	1,228	12/01	6,255	8,866	
COMOPTVEFOR PD	PD	COMOPTVEFOR	3,760	0		0		0		0	3,760	
<b>Subtotal Test &amp; Evaluation</b>			<b>3,760</b>	<b>0</b>		<b>1,383</b>		<b>1,228</b>		<b>6,255</b>	<b>12,626</b>	
Remarks												
Contractor Engineering Support	WX	Various	1,325	156		0		0		0	1,481	
<b>Subtotal Management</b>			<b>1,325</b>	<b>156</b>		<b>0</b>		<b>0</b>		<b>0</b>	<b>1,481</b>	
Other FY95 & Prior Costs			551,354								551,354	
SBIR Assessment												
<b>Total Cost</b>			<b>1,816,020</b>	<b>12,249</b>		<b>1,383</b>		<b>1,228</b>		<b>6,255</b>	<b>1,837,135</b>	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)						DATE		February 2000		
BUDGET ACTIVITY		PE NUMBER AND TITLE								
7 - Operational System Development		0206313M Marine Corps Communications Systems								
	COST (In Million ) s	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
	Total Program Element (PE) Cost	49208	96293	96153	93735	78134	45811	35799	Continuing	Continuing
C2270	Command Post Systems	7328	22981	22707	16501	12868	10334	9907	Continuing	Continuing
C2271	Maneuver C2 Systems	1654	981	1953	744	629	0	0	0	5961
C2272	Intelligence C2 Systems	3951	13763	8634	9861	10124	7174	7338	Continuing	Continuing
C2273	Air Operations C2 Systems	5985	16324	24780	17889	8519	6690	4045	Continuing	Continuing
C2274	C2 Warfare Systems	3191	10329	2663	4290	4930	3119	3319	Continuing	Continuing
C2275	Radio Systems	2173	0	0	0	0	0	0	0	2173
C2276	Communications Switching and Control Systems	1538	1831	227	0	0	0	0	0	3596
C2277	Systems Engineering and Integration	9446	7156	6514	6832	6554	6554	6390	Continuing	Continuing
C2278	Air Defense Weapons Systems	1855	9705	21730	27408	21754	6641	4057	Continuing	Continuing
C2315	Training Devices/Simulators	8213	12088	5871	9529	12221	5042	486	Continuing	Continuing
C2510	MAGTF CSSE S&E	0	1135	1074	681	535	257	257	Continuing	Continuing
C2664	Joint Task Force Enhanced Communications	3874	0	0	0	0	0	0	0	3874
	Quantity of RDT&E Articles									
R-1 Line Item 175						Budget Item Justification				

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 2000</b>
BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	
<p>(U) <u>Mission Description and Budget Item Justification:</u> This program element provides funding to develop the command and control (C2) support and information infrastructures for the Fleet Marine Force and supporting establishment. Doctrinally, the C2 support system and the information infrastructure form two parts of a triad of capabilities which permits command and control systems to be transformed into a complete operating system. The third element of the triad is command and control organization and is not covered in this program element. USMC command and control is divided into six functional areas and one supporting functional area as follows: maneuver C2, intelligence C2, fire support C2, air operations C2, combat service support C2, warfare C2, and C2 support (information processing and communications). Within this program element, subprojects have been grouped by C2 functional area for more efficient planning. Air defense weapons systems have been added to facilitate planning and a separate project is used for systems assigned to the supporting establishment. Subprojects which support the commander's decision processes have been collected into the Command Post Systems project since these systems must work in close cooperation to ensure effective C2 of Marine Air Ground Task Forces. The Coastal Battlefield Reconnaissance and Analysis (COBRA) system is a passive multispectral sensor system capable of operating in a PIONEER unmanned aerial vehicle (UAV). Imagery recorded on the UAV or disseminated via data link is analyzed by the COBRA ground station. Ground station algorithm processing provides near real-time automatic minefield detection with Differential Global Positioning System (DGPS) location accuracy.</p> <p>(U) <u>Justification for Budget Activity:</u> This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.</p>		
R-1 Line Item 175	Budget Item Justification	

**UNCLASSIFIED**

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 2000	
BUDGET ACTIVITY		PE NUMBER AND TITLE		PROJECT							
7 - Operational System Development		0206313M Marine Corps Communications Systems		C2270							
COST (In Million ) s		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost	
Command Post Systems		7328	22981	22707	16501	12868	10334	9907	Continuing	Continuing	
Quantity of RDT&E Articles											
<p><b>A. (U) Mission Description and Budget Item Justification:</b></p> <p>(U) Systems assigned to this project are to be used by commanders and their staffs to process, fuse, and tailor information to assist decision-making and enhance situational awareness. They will integrate and share information from sources both internal and external to the Marine Air-Ground Task Force (MAGTF) to provide a shared understanding of the battlespace.</p> <ol style="list-style-type: none"> <li>Decision support integrates information from the seven Command and Control (C2) functional areas and the support function. The information is tailored to support the users' specific needs. As a result of the MAGTF C4I Baseline subproject, an integrated migration strategy is being incorporated into the MAGTF software baseline, which will be common across and used by all MAGTF C4I programs.</li> <li>The Tactical Command Operations (TCO) will provide systems to the command post which support Maneuver C2. Maneuver C2 is the executive layer of decision support that pulls and fuses information from other functional areas.</li> <li>The Intelligence Analysis Systems (IAS) supports the employment of reconnaissance, surveillance, and target acquisition resources and the timely planning and processing of all-source intelligence; it ensures that tactical intelligence is tailored to meet specific mission requirements. A Marine Expeditionary Force (MEF) IAS variant will also process signal intelligence.</li> <li>Advanced Field Artillery Tactical Data Systems (AFATDS) will consist of fire support command and control software fielded on Marine Corps common hardware. AFATDS will provide the MAGTF with an automated ability to rapidly integrate, all supporting arm assets into maneuver plans.</li> <li>The Advanced Tactical Air Command Center (ATACC) functions as the operational command post of the MAGTF ACE. It provides automated assistance for planning and executing tactical air operations, and provides voice and data interface with joint and combined Air C2 agencies. The Phase I ATACC was fielded 1st Qtr FY96. The Improved Direct Air Support Center (IDASC) links information and systems needed to conduct Air Operations C2 with Maneuver C2 of the ground combat element of the MAGTF.</li> </ol>											
R-1 Line Item 175										Budget Item Justification	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT	
7 - Operational System Development	0206313M Marine Corps Communications Systems	C2270	
<p>6. The Expeditionary Integrated Combat Operations Center (EICOC)/Unit Operations Center (UOC) project develops and transitions two Command and Control Imperative ATDs (the Expeditionary Integrated Combat Operations Center (EICOC) and the Joint Tactical Communications (JT COMMs) ATDs) into various Marine Corps and Joint Engineering and Manufacturing Development (E&amp;MD) efforts. EICOC development efforts focus on: Cognitive Task Analysis (CTA); enhanced ergonomic physical design; evaluation of advanced multimedia hardware; integration and networking with advanced development communication systems; and advanced software development to support systems integration and advanced battlefield visualization concepts. EICOC developments are tailored to support transition of software and hardware developments as PIPs to the established MAGTF C4I baseline. EICOC is the interim name for the Unit Ops Center (UOC). The UOC name will replace the EICOC name starting with FY00. Unit Operations Center (UOC) will provide a facility and components for the integration of current and planned battlefield automation systems. It will be, in essence a "system of systems" designed to optimize the positioning, interaction, and flow of information among the various staff agencies (G-2, G-3, Operations Directorate, etc.) and their automated information systems and between the unit and higher, adjacent or subordinate units or headquarters. The Marine corps deploys Component/Unit Task Force (JTF/Marine Air Ground Task Force (MAGTF)) command elements throughout the world to fulfill operational requirements, often in joint/combined forces arenas. The UOC is designed in garrison and tactical versions. The tactical version is called the Combat Operations Center (COC) which is an outgrowth of the integrated COC (ICOC), COC-Interim (COC(I)), and the Enhanced COC (ECOC) developments over the last two years. The garrison version is called the Command Center (CC).</p> <p>7. TCAC PIP is a Product Improvement Plan (PIP) based on the MEF IAS program. TCAC PIP is a semi-automated signals intelligence (SIGINT) processing, analysis and reporting system integrated in to one HMMWV mounted standard tactical shelter housing essential computer and communication resources. Internal and external workstations, when connected via a local area network, will extend functional capabilities to multiple users. The system is modular in design allowing stand-alone operations support during high mobility or contingency operations. Essential voice and data communications and SIGINT processing capabilities will support and automate the management and dissemination of SIGINT-derived intelligence reports.</p>			
R-1 Line Item 175		Budget Item Justification	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT	
7 - Operational System Development	0206313M Marine Corps Communications Systems	C2270	
PROGRAM ACCOMPLISHMENTS AND PLANS:			
(U) FY 1999 Accomplishments:			
• (U) \$	1055 TCO: Initiated Phase IV ORD requirements.		
• (U) \$	157 TCO: Program Management Support		
• (U) \$	65 TCO: Performed testing on existing systems.		
• (U) \$	21 IAS: Program Management Support.		
• (U) \$	505 IAS: Developed intelligence applications into the C2PC software baseline.		
• (U) \$	369 IDASC: Completed investigation of hardware ECPs for the HMD DASC system for migration towards a common USMC Aviation Command and Control Communications System.		
• (U) \$	221 IAS MOD: Continued research of hardware ECPs for MEF IAS and IAS Suites.		
• (U) \$	164 IAS MOD: Continued program management for ECPs.		
• (U) \$	460 MAGTF C4I BASELINE: Continued development of client software focused on the Joint Operations Planning and Execution Segments (JOPES) within GCCS.		
• (U) \$	822 MAGTF C4I BASELINE: Began software development necessary to allow the integration of the Combat Operations Center Interim (COC(I)) into the MAGTF C4I software baseline.		
• (U) \$	609 EICOC/UOC: Built two (2) notional BN-Level COC prototypes.		
• (U) \$	150 EICOC/UOC: Conducted an Early Operational Assessment of these prototypes		
• (U) \$	456 EICOC/UOC: Continued investigation of COTS/GOTS hardware and software for COC component systems and subsystems; drafted COC systems; drafted COC subsystems segment specifications.		
• (U) \$	1,484 AFATDS: Began and completed development and interoperability efforts on AFATDS 98 Software. Migrated to the Defense Information Infrastructure Common Operating Environment (DII COE). Added additional fire support functionality to support Marine Corps fire support systems. Identified a smaller computer for AFATDS.		
• (U) \$	790 TCAC PIP: Developed M65 Multi-land Family and integrated CA & TN tools. Integrated with Joint Signet Systems, complete the Signet analysis toolkit , matches integration.		
(U)Total \$	7,328		
		R-1 Line Item 175	Budget Item Justification

R-1 Line Item 175

Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)			DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE	PROJECT	
7 - Operational System Development		0206313M Marine Corps Communications Systems	C2270	
(U) FY 2000 Planned Program:				
• (U) \$	760	TCO: Begin incorporating Phase V ORD requirements , complete Phase IV ORD requirements and integrate software changes into existing system.		
• (U) \$	302	TCO: Forward finances effort to incorporate Phase V ORD requirements, complete PHASE IV ORD requirements and integrate software changes into existing system.		
• (U) \$	129	TCO: Program Management Support.		
• (U) \$	194	TCO: Conduct OT&E on previously integrated systems.		
• (U) \$	400	TCAC: Develop software to maintain compatibility with Signals Intelligence systems.		
• (U) \$	490	TCAC: Integrate signals intelligence correlator.		
• (U) \$	201	IAS MOD: Conduct system interoperability testing with Marine Corps and Joint systems to include: TCO,GCCS, ASAS, AFATDS, and other emerging systems as needed to ensure Marine Corps compatibility in the joint arena.		
• (U) \$	200	IAS MOD: Begin integration of ECP changes into manuals.		
• (U) \$	193	IAS MOD: Continue C2PC Intel software development.		
• (U) \$	156	IAS MOD: Forward finances effort to continue C2PC Intel software development		
• (U) \$	1618	MAGTF C4I BASELINE: Design, and build legacy system software release.		
• (U) \$	2357	MAGTF C4I BASELINE: Complete trade studies, market surveys and functional assessments on Combat Information C2 System Applications from Squad Leader to MARFOROPFAC.		
• (U) \$	1400	MAGTF C4I BASELINE: Design and build DII COE compliant prototype.		
• (U) \$	400	MAGTF C4I BASELINE: Conduct an Early Operational Assessment of the DII/COE compliant prototype.		
• (U) \$	277	MAGTF C4I BASELINE: Commence disciplined risk management, requirements tracking and system engineering and analysis efforts for the DII/COE compliant prototype.		
• (U) \$	1723	MAGTF C4I BASELINE: Forward finances disciplined risk management, requirements tracking and system engineering and analysis efforts for the DII/COE compliant prototype.		
• (U) \$	1739	AFATDS: Begin and complete development efforts on AFATDS 99 Software. Migrate to DII COE. Add additional fire support functionality to support Marine Corps fire support systems. Begin training of test beds users (designated Marine Units) for release of AFATDS 99 Software. Develop interoperability with MAGTF C4I system (IOW, DACT, TLDHS, and TCO).		
• (U) \$	521	AFATDS: Forward finances completion of development efforts on AFATDS 99 Software. Migrate to DII COE. Add additional fire support functionality to support Marine Corps fire support systems. Begin training of test beds users (designated Marine Units) for release of AFATDS 99 Software. Develop interoperability with MAGTF C4I system (IOW, DACT, TLDHS, and TCO).		
• (U) \$	4800	UOC: Develop three (3) mobile Combat Operations Centers (COC) at various echelons of command and two (2) fixed Command Center (CC) prototypes; complete trade studies, market surveys and functional assessments.		

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Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT	
7 - Operational System Development	0206313M Marine Corps Communications Systems	C2270	
<ul style="list-style-type: none"> <li>• (U) \$ 1076 UOC: Conduct Early Operational Assessments of the prototypes three (3) COC and two (2) CC prototypes.</li> <li>• (U) \$ 1975 UOC: Continue research on COTS/GOTS hardware and software for COC component systems and subsystems.</li> <li>• (U) \$ 1970 UOC: Commence disciplined risk management, requirements tracking and system engineering and analysis efforts for the prototypes three (3) COC and two (2) CC prototypes..</li> </ul>	(U) \$ 100 UOC: Program Management Support. (U)Total \$ 22,981		
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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)			DATE	February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE		PROJECT	
7 - Operational System Development	0206313M Marine Corps Communications Systems		C2270	
<p>(U) FY 2001 Planned Program:</p> <ul style="list-style-type: none"><li>• (U) \$ 793 TCO: Complete Phase V ORD requirements.</li><li>• (U) \$ 336 TCO: Integrate software changes into existing system and perform testing.</li><li>• (U) \$ 0 TCO: Incorporate Phase V ORD requirements, complete PHASE IV ORD requirements and integrate software changes into existing system. This effort forward financed with FY00 funding in the amount of \$302K.</li><li>• (U) \$ 140 IAS MOD: Continue research of hardware ECPs for MEF IAS, IAS suites, and IAS workstation.</li><li>• (U) \$ 200 IAS MOD: Continue system interoperability testing.</li><li>• (U) \$ 243 IAS MOD: Continue C2PC Intel software development.</li><li>• (U) \$ 0 IAS MOD: Continue C2PC Intel software development. This effort forward financed with \$156K of FY00 funding.</li><li>• (U) \$ 1360 MAGTF C4I BASELINE: Complete all trade studies, market surveys and functional assessments.</li><li>• (U) \$ 2539 MAGTF C4I BASELINE: Continue designing and building DII COE compliant prototypes.</li><li>• (U) \$ 1513 MAGTF C4I BASELINE: Conduct an Early Operational Assessment of a multi-echelon environment of all prototypes.</li><li>• (U) \$ 1261 MAGTF C4I BASELINE: Continue disciplined risk management, requirements tracking and system engineering and analysis efforts.</li><li>• (U) \$ 100 MAGTF C4I BASELINE: Program Management Support.</li><li>• (U) \$ 0 MAGTF C4I BASELINE: Continue disciplined risk management, requirements tracking and system engineering and analysis efforts for the DII/COE compliant prototype. This effort forward financed with \$1,723 of FY00 funding.</li><li>• (U) \$ 1949 AFATDS: Begin and complete development efforts on AFATDS 02 Software. Migrate to DII COE. Add additional fire support functionality to support Marine Corps fire support systems. Begin training of test beds users (designated Marine Units) for release of AFATDS 02 Software. Develop interoperability with MAGTF C4I system (IOW, DACT, TLDHS, and TCO) and Navy fire support control systems.</li><li>• (U) \$ 0 AFATDS: Begin and complete development efforts on AFATDS 99 Software. Migrate to DII COE. Add additional fire support functionality to support Marine Corps fire support systems. Begin training of test beds users (designated Marine Units) for release of AFATDS 99 Software. Develop interoperability with MAGTF C4I system (IOW, DACT, TLDHS, and TCO). This effort forward financed with \$521K of FY00 funding.</li><li>• (U) \$ 7773 UOC: Develop four (4) additional COCs at other command echelons previously not developed and one (1) CC prototype.</li><li>• (U) \$ 1638 UOC: Conduct an Early Operational Assessment of the prototypes for the four (4) COC and one (1) CC prototype.</li><li>• (U) \$ 1481 UOC: Continue research on COTS/GOTS hardware and software for COC component systems for the four (4) COC and one (1) CC prototype.</li><li>• (U) \$ 1281 UOC: Continue disciplined risk management, requirements tracking and system engineering and analysis efforts for the DII/COE compliant prototype.</li><li>• (U) \$ 100 UOC: Program Management Support.</li></ul> <p>(U)Total \$ 22707</p>				
			R-1 Line Item 175	Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									
BUDGET ACTIVITY						DATE		PROJECT	
<b>7 - Operational System Development</b>						<b>February 2000</b>		<b>C2270</b>	
						PE NUMBER AND TITLE			
						<b>0206313M Marine Corps Communications Systems</b>			
<b>B. (U) Project Change Summary</b>						<b>FY 1999</b>	<b>FY 2000</b>	<b>FY 2001</b>	
(U) Previous President's Budget						10218	23109	23490	
(U) Adjustments to Previous President's Budget						-2890	-128	-783	
(U) Current Budget Submit						7328	22981	22707	
(U) Change Summary Explanation:									
(U) Funding: FY99 decrease in the amount of \$2,890K reflects a SBIR tax assessment (\$157K), a minor inflation adjustment (\$58K) and reprioritization of funds (\$2675K). FY00 decrease reflects a minor inflation adjustment. FY01 decrease of (\$783K) is due to reprioritization of programs within the Marine Corps and a minor inflation adjustment.									
(U) Schedule: TCO: Schedule change is contributed to contractor protest.									
(U) Technical: N/A									
<b>C. (U) Other Program Funding Summary</b>						<b>FY 1999</b>	<b>FY 2000</b>	<b>FY 2001</b>	<b>FY 2002</b>
(APPN, BLI #, NOMEN)									
(U) PMC BLI# 463100 TCO						2246	0	1270	14
(U) PMC BLI# 474700 IAS						10063	0	0	0
(U) PMC BLI# 463600 IDASC						3502	0	0	0
(U) PMC BLI# 474900 IAS MOD						1655	1397	1430	1356
(U) PMC BLI# 463100 AFATDS						10104	3052	2917	2306
(U) PMC BLI# 463100 UOC						0	0	0	17266
(U) TCO (O&MMC)						339	1527	1516	0
(U) MEF IAS (O&MMC)						1467	1831	1718	0
(U) IDASC (O&MMC)						137	214	212	0
(U) AFATDS (O&MMC)						0	271	460	0
(U) TCAC (O&MMC)						1128	1277	1246	0
<b>(U) Related RDT&amp;E</b>									
(U) PE 0301301L (Department of Defense Intelligence and Information Systems/Military Intelligence Integrated Data System/Integrated Data Base I and II) (Defense Intelligence Agency).									
(U) Navy Tactical Flag Communication and Control System.									
						R-1 Line Item 175		Budget Item Justification	

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# RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE February 2000

BUDGET ACTIVITY

7 - Operational System Development

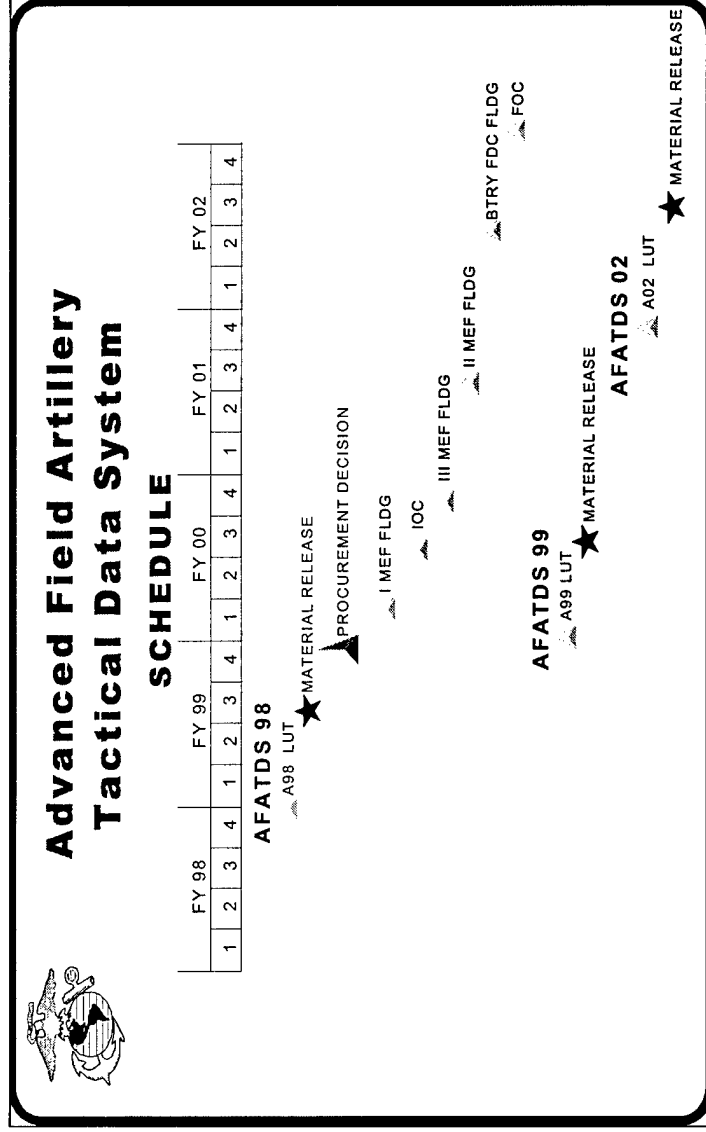
PE NUMBER AND TITLE

0206313M Marine Corps Communications Systems

PROJECT  
C2270

## D. (U) Schedule Profile

AFATDS Schedule:



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Budget Item Justification

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# RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

February 2000

BUDGET ACTIVITY

7 - Operational System Development

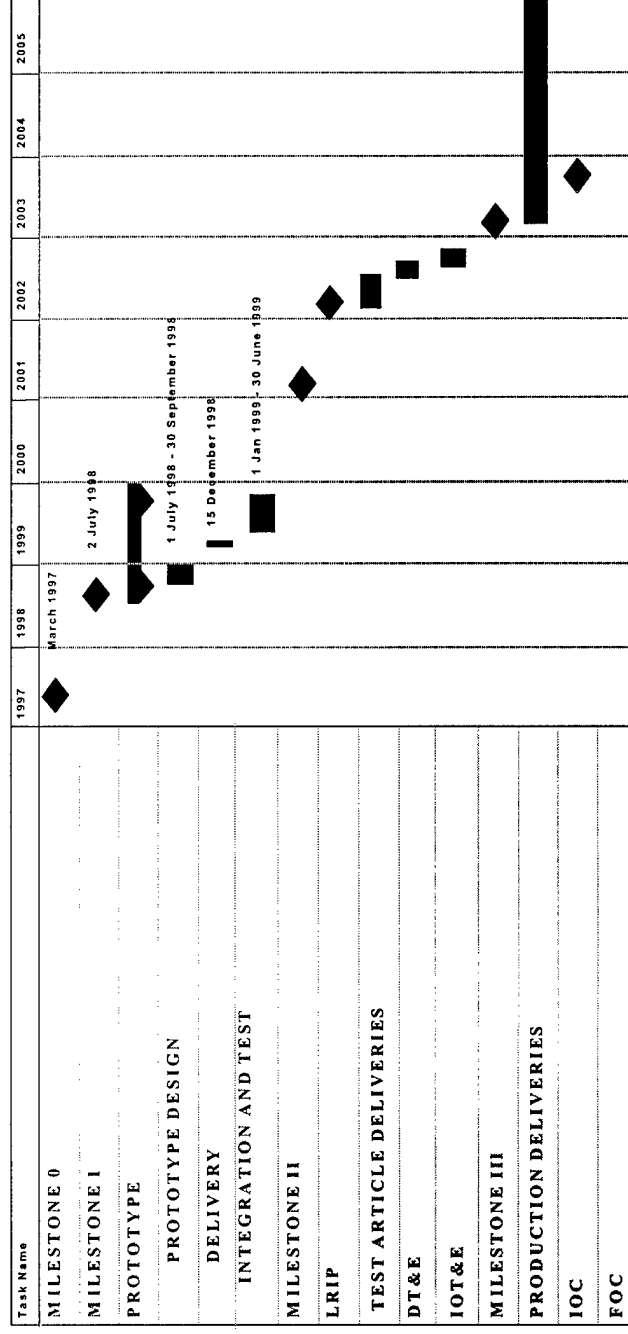
PE NUMBER AND TITLE

0206313M Marine Corps Communications Systems

PROJECT

C2270

## UOC Program Schedule



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Budget Item Justification

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)					DATE	February 2000	PROJECT			
BUDGET ACTIVITY					PE NUMBER AND TITLE		C2270			
7 - Operational System Development					0206313M Marine Corps Communications Systems					
A. (U) Project Cost Breakdown					FY 1999	FY 2000	FY 2001			
Primary HW/SW Development					6675	20781	18820			
Test and Evaluation					286	1871	3545			
Program Management Support					367	329	342			
Total					7328	22981	22707			
B. Budget Acquisition History and Planning Information										
Performing Organizations										
Contractor or Government	Contract Method/Type	Award or Obligation	Performing Activity	Project Office	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Product Development Organizations										
EICOC/UOC:										
SSC Charleston	WR	Aug 99			674	969	8745	10535	CONT	CONT
TCO:										
MCTSSA, Camp Pendleton, CA	RCP	Dec98		3559	584	215	250	107	CONT	CONT
NWSC, Crane, IN	RCP	Oct 98				150	86	0	0	236
MCSC	RCP	Oct 98				75	0	0	0	75
SPAWAR Charleston, SC	WR	Oct 97			72	615	726	686	CONT	CONT
IAS:										
MCTSSA, Camp Pendleton, CA	RCP	Dec 98		505		505	0	0	0	505
IAS MOD:										
NSWC, Crane, IN	C/RCP	Dec 98		871	481	50	200	140	0	871
SPAWAR Charleston, SC	C/RCP	Jan 99		1227	0	171	349	243	464	1227
IDASC:										
					R-1 Line Item 175		Budget Item Justification			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	February 2000
BUDGET ACTIVITY										PROJECT	
7 - Operational System Development										C2270	
PE NUMBER AND TITLE										0206313M Marine Corps Communications Systems	
										0	CONT
NSWC, Crane, IN	WR	Oct 97	445	445	205	25	0	0	0	CONT	CONT
MCSC, Quantico, VA	WR	Jan 99	0	0	0	40	0	0	0	0	40
NATICK	WR	Jun 99	0	0	0	40	0	0	0	0	40
WR AFB	RCP	Apr 99	0	0	0	128	0	0	0	0	128
MCSC, Quantico, VA	RCP	Jul 99	0	0	0	116	0	0	0	0	116
MCTSSA Camp Pendleton, CA	WR	Oct 97	471	471	229	20	0	0	0	CONT	CONT
MAGTF C4I											
BASELINE:											
SSC, Charleston, SC	WR	Jan 99	4026	4026	352	1282	7275	5160	5160	CONT	CONT
AFATDS:											
USA, Ft. Sill, OK	MIPR	Jan 97	1402	1402	1402	78	80	80	80	CONT	CONT
MCSC, Quantico, VA	Omnibus	Oct 98			100	137	590	590	590	CONT	CONT
USA, Ft. Wayne, IN	CPFF/MIPR	Mar 00			0	0	1240	929	929	CONT	CONT
Travel (Various)	WR	Sep 99				31					
NAVELEX, SC	WR	Dec 98				200					
USA, CECOM Monmouth, NJ	CPFF/MIPR	Jan 99	2786	2786	0	1038	350	350	350	CONT	CONT
TCAC PIP:											
BTG, Fairfax, VA	RCP	Jan 99	2580	2580	0	790	890	0	0	CONT	CONT
Support and Management Organizations											
EICOC/UOC:											
Marcorsyscom	WR	Dec 00				25	100	100	100	CONT	CONT
TCO:											

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Budget Item Justification

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE		PROJECT							
7 - Operational System Development		0206313M Marine Corps Communications Systems		C2270							
MCTSSA, Camp Pendleton, CA	RCP	Jan 99	512	512	97	157	129	142	CONT	CONT	
IAS											
Travel						21	0	0	0	21	
IAS MOD:											
SPAWAR	WR	Nov 98			0	164	0	0	0	164	
Charleston, SC											
MAGTF C4I											
Baseline:											
MARCORSYSCO	FFP/CPFF	Jan 99			0	0	100	100	CONT	CONT	
MCTQ, Quantico, VA (Logicon, Stafford, VA)											
Test and Evaluation Organizations											
TCO:											
MCTSSA, Camp Pendleton, CA	RCP	Oct 97	537	537	80	65	194	194	CONT	CONT	
IAS MOD:											
ARL, Adelphi, MD	C/MIPR	Jan 00			0	0	101	100	CONT	CONT	
MCTSSA Camp Pendleton, CA	RCP	Jan 00			0	0	100	100	CONT	CONT	
MAGTF C4I											
Baseline:											
MCOTEA	RCP	Nov 99			0	0	400	1513	CONT	CONT	
EICOC/UOC:											
MCTSSA, Camp Pendleton, CA	WR	Oct 97	2581	2581	581	0	0	0	CONT	CONT	
MCOTEA	RCP	Nov 99				0	1076	1638	CONT	CONT	
CECOM	WR	Nov 98	0	0	0	1	0	0	CONT	CONT	
CECOM	RCP	May 99	0	0	0	120	0	0	CONT	CONT	
CECOM	RCP	Mar 99	0	0	0	100	0	0	CONT	CONT	
R-1 Line Item 175										Budget Item Justification	

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### RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

DATE \_\_\_\_\_

February 2000

## BUDGET ACTIVITY

PE NUMBER AND TITLE

## 7 - Operational System Development

**0206313M Marine Corps Communications**

PROJECT

**C2270**

	Total Prior to <u>FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	Budget to Complete	Total Program
Subtotal Product Development	4099	6675	20781	18820	CONT	CONT
Subtotal Support and Management	209	286	1871	3545	CONT	CONT
Subtotal Test and Evaluation	661	367	329	342	CONT	CONT
Total Project	4969	7328	22981	22707	CONT	CONT

R-1 Line Item 175

### Budget Item Justification

(Exhibit R-3, Page 15 of 85)

**UNCLASSIFIED**

## UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE		PROJECT							
7 - Operational System Development		0206313M Marine Corps Communications Systems		C2271							
COST (In Millions)		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost	
C2271	Maneuver C2 Systems	1654	981	1953	744	629	0	0	0	5961	
Quantity of RDT&E Articles											

**A. (U) Mission Description and Budget Item Justification:**

(U) Maneuver C2 is the executive layer of decision support that retrieves and fuses information from the functional areas. It provides an integrated representation of the battlespace or a specific area of concern. The subprojects below develop systems which report unit status and location to the Tactical Combat Operations (TCO) and Advanced Tactical Air Command Central (ATACC). They also disseminate maneuver information throughout the battlespace.

1. The Joint Tactical Information Distribution System (JTIDS) provides unit location and status in near-real-time, primarily for aircraft, ships, and air defense systems.
2. The Data Automated Communications Terminal (DACT) will extend situational awareness to echelons below the battalion level within the Marine Corps. The DACT will receive, store, retrieve, create, modify, transmit, and display map overlays, operational messages/reports, and position information via tactical radios, networks, and/or wire lines. A phased approach for fielding the full functionality of the system will be used consisting of software upgrades and enhancements to allow interoperability with other C4I systems

**PROGRAM ACCOMPLISHMENTS AND PLANS**

**(U) FY 1999 Accomplishments:**

- (U) \$ 85 DACT: Developed Hardware vehicle mounted domain hardware.
- (U) \$ 161 DACT: Developed Application Software -- Phase I.
- (U) \$ 80 DACT: System Integrated -- vehicle mounted domain hardware and phase I software.
- (U) \$ 275 DACT: Developed training package, program documentation, program plans, and operational concepts for vehicle mounted domain.
- (U) \$ 75 DACT: Conducted operational assessment testing.
- (U) \$ 204 DACT: Program Management Support.
- (U) \$ 774 JTIDS: Completed the TADIL-J I/F to TAOM prototype.

(U) Total \$ 1,654

R-1 Line Item 175

Budget Item Justification

(Exhibit R-2, Page 16 of 85)

## UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000																
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT																	
7 - Operational System Development	0206313M Marine Corps Communications Systems	C2271																	
<p>(U) FY 2000 Planned Program:</p> <ul style="list-style-type: none"> <li>• (U) \$ 111 DACT: Develop dismounted end-user hardware.</li> <li>• (U) \$ 160 DACT: Develop Application Software – Phase II.</li> <li>• (U) \$ 250 DACT: System Integration – dismounted end-user hardware and Phase II Software.</li> <li>• (U) \$ 115 DACT: Continue Program Management Support.</li> <li>• (U) \$ 100 DACT: Continue develop training package, program documentation, program plans, and operational concepts for dismounted end-user domain.</li> <li>• (U) \$ 245 DACT: Conduct Initial Operational Test and Evaluation (IOT&amp;E).</li> </ul> <p>(U)Total \$ 981</p> <p>(U) FY 2001 Planned Program:</p> <ul style="list-style-type: none"> <li>• (U) \$ 175 DACT: Develop dismounted gateway hardware.</li> <li>• (U) \$ 320 DACT: Develop Application Software – Phase III.</li> <li>• (U) \$ 787 DACT: System Integration – dismounted gateway hardware and Phase III software.</li> <li>• (U) \$ 183 DACT: Continue to develop training package, documentation, program plans and operational concepts for gateway domain.</li> <li>• (U) \$ 290 DACT: Conduct Follow-on Operational Test and Evaluation (FOT&amp;E).</li> <li>• (U) \$ 198 DACT: Continue Program Management Support.</li> </ul> <p>(U)Total \$ 1,953</p> <p><b>B. (U) Project Change Summary</b></p> <table border="0"> <thead> <tr> <th></th> <th>FY 1999</th> <th>FY 2000</th> <th>FY 2001</th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget</td> <td>2067</td> <td>986</td> <td>446</td> </tr> <tr> <td>(U) Adjustments to Previous President's Budget</td> <td>-413</td> <td>-5</td> <td>1507</td> </tr> <tr> <td>(U) Current Budget Submit</td> <td>1654</td> <td>981</td> <td>1953</td> </tr> </tbody> </table> <p>(U) Change Summary Explanation:</p> <p>(U) Funding: FY99 Decrease in the amount of \$18K for SBIR tax assessment. Decrease of \$386K is due to reprioritization of programs within the Marine Corps. Decrease of \$9K for NavCompt adjustments. FY00 Decrease in the amount of \$5K for General Reductions. FY01 Increase in the amount of \$1,522K is due to reprioritization of programs with the Marine Corps and a decrease of \$13K is due to PBD 604 and a decrease of \$2K is due to NavCompt adjustments.</p> <p>(U) Schedule: N/A</p> <p>(U) Technical: N/A</p>					FY 1999	FY 2000	FY 2001	(U) Previous President's Budget	2067	986	446	(U) Adjustments to Previous President's Budget	-413	-5	1507	(U) Current Budget Submit	1654	981	1953
	FY 1999	FY 2000	FY 2001																
(U) Previous President's Budget	2067	986	446																
(U) Adjustments to Previous President's Budget	-413	-5	1507																
(U) Current Budget Submit	1654	981	1953																

R-1 Line Item 175

Budget Item Justification

(Exhibit R-2, Page 17 of 85)

UNCLASSIFIED

## UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE	February 2000	
BUDGET ACTIVITY		PE NUMBER AND TITLE						PROJECT		
7 - Operational System Development		0206313M Marine Corps Communications Systems						C2271		
		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
C.	(U) Other Program Funding Summary (APPN, BLI #, NOMEN)									
	(U) PMC, BLI #463200, DACT	1956	6789	0	9575	6556	0	0	0	24876
	(U) PMC, BLI #463200, JTIDS	7510	0	0	0	0	0	0	0	7510
	(U) Related RDT&E									
	None									

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## UNCLASSIFIED

RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

February 2000

PE NUMBER AND TITLE

**0206313M Marine Corps Communications Systems**

#### **D. (U) Schedule Profile**

## DACT Program Structure

[illegible]

### Budget Item Justification

**UNCLASSIFIED**

## RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE \_\_\_\_\_

February 2000

## BUDGET ACTIVITY

## 7 - Operational System Development

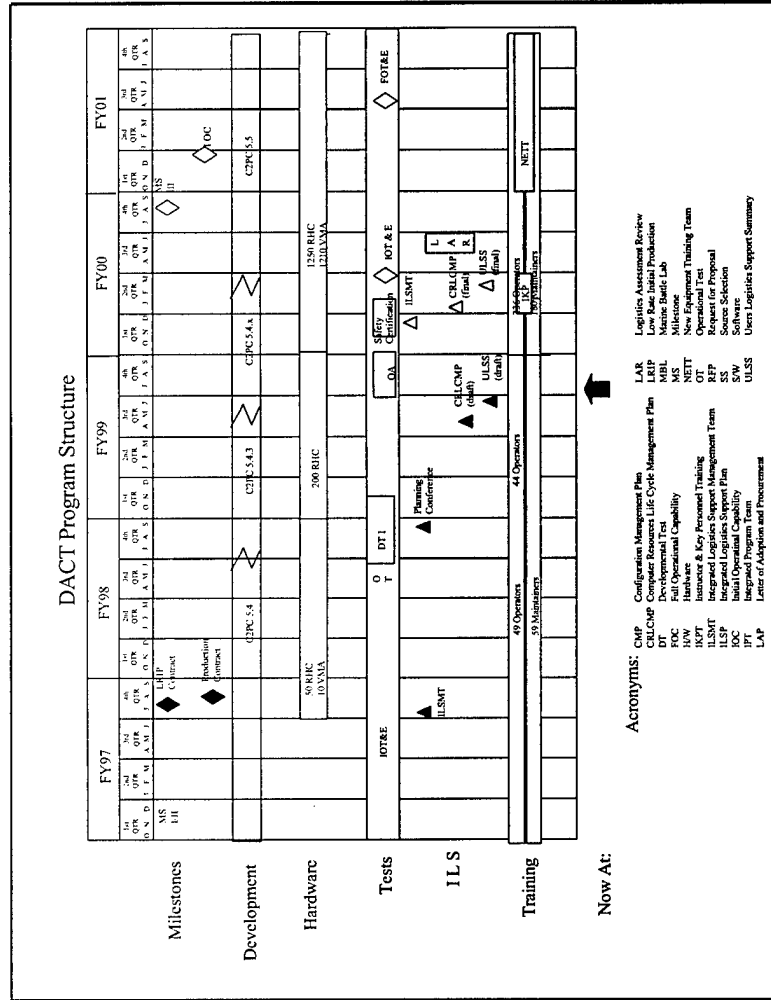
PE NUMBER AND TITLE

**0206313M Marine Corps Communications Systems**

PROJECT  
C2271

#### D. (U) Schedule Profile

DACT Schedule:



**Now At:**

**R-1 Line Item 175**

### Budget Item Justification

(Exhibit R-2, Page 19 of 85)

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## UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)						DATE	February 2000	PROJECT
BUDGET ACTIVITY		PE NUMBER AND TITLE						C2271
7 - Operational System Development		0206313M Marine Corps Communications Systems						
		FY 1999	FY 2000	FY 2001				
A. (U) Project Cost Breakdown								
Production Development		1370	621	1465				
Support and Management		209	115	198				
Test and Evaluation		75	245	290				
Total		1654	981	1953				
B. Budget Acquisition History and Planning Information								
Performing Organizations								
Contractor or Government	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity	EAC	Project Office EAC	Total Prior to FY 1999	FY 1999	FY 2000
Product Development Organizations								
JTIDS:								
NSWC	WR	Jun 99		0	0	0	483	0
Crane, IN								
MCSC	RCP	Jul 99		0	0	0	286	0
Quantico, VA								
DACT:								
Raytheon	TM	Jan 97				1,990	161	230
EPS	FFP	Aug 97		0		0	80	116
INRI	TM	May 97		526		526	85	155
OSEC	GSA	Nov 98		0		0	275	120
Boeing		Jul 99		0		0	0	0
Support and Management Organizations								
JTIDS:								
2nd MAW	WR	Aug 99	2	0	0	0	2	0
						R-1 Line Item 175	Budget Item Justification	

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## UNCLASSIFIED

### RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

February 2000

BUDGET ACTIVITY

## 7 - Operational System Development

PE NUMBER AND TITLE

**0206313M Marine Corps Communications Systems**

PROJECT  
C2271

	Mar 99	3	0	3	0	0	0	3
3 <sup>rd</sup> MAW San Diego, CA DACT:	WR							
MCTSSA	WR	Oct 99		1,234	25	25	0	50
MCCDC	WR	Oct 00		43	18	0	15	53
Logicon	FFP			145	66	90	120	416
OSEC	GSA			70	95	0	63	258
<b>Test and Evaluation Organizations</b>								
MCOTEA	WR	Jan 99	120	0	75	25	20	120
FMF	WR	Jul 99	599	0	0	220	270	599
<b>Government Furnished Property Contract</b>								
Item Description	Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete
<b>Product Development Property N/A</b>								
<b>Support and Management Property N/A</b>								
<b>Test and Evaluation Property N/A</b>								
Total Prior to FY 1999					FY 1999	FY 2000	FY 2001	Budget to Complete
Subtotal Product Development				2516	1370	621	1465	1128
Subtotal Support and Management				1492	209	115	198	260
Subtotal Test and Evaluation				0	75	245	290	0
Total Project				4008	1654	981	1953	1388
Total Program					FY 1999	FY 2000	FY 2001	Budget to Complete
Subtotal Product Development				7100	1128			
Subtotal Support and Management				2274	260			
Subtotal Test and Evaluation				610	0			
Total Project				9984	1388			

R-1 Line Item 175

### Budget Item Justification

(Exhibit R-3, Page 21 of 85)

**UNCLASSIFIED**

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 2000	
BUDGET ACTIVITY		PE NUMBER AND TITLE		PROJECT							
7 - Operational System Development		0206313M Marine Corps Communications Systems		C2272							
		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost	
C2272 Intelligence C2 Systems		3951	13763	8634	9861	10124	7174	7338	Continuing	Continuing	
Quantity of RDT&E Articles											

**A. (U) Mission Description and Budget Item Justification:**

(U) Intelligence Command and Control (C2) supports the employment of reconnaissance, surveillance, and target acquisition resources and the timely planning and processing of all-source intelligence. It ensures that all-source tactical intelligence is tailored to meet specific mission requirements. The systems below collect raw intelligence data on the battlefield, convert raw intelligence data into processed information and deliver the processed products to the Intelligence Analysis Systems (IAS) for analysis.

1. The MANPACK Secondary Imagery Distribution System (SIDS) is used to distribute processed imagery throughout the Marine Corps Communications Systems.
2. Tactical Exploitation of National Capabilities (TENCAP) is a program designed to enhance the ability of tactical Marine Corps forces to exploit the capabilities of national intelligence-gathering systems. Congressionally directed, it requires close liaison with the intelligence community and involves complex and highly-sensitive activities.
3. The Topographic Production Capability (TPC) is an advanced Geographic Information System, which employs commercial computer and software to provide the framework data for the common battlefield visualization by producing both hardcopy and digital geographic intelligence.
4. The Joint Surveillance Target Attack Radar (JSTARS) connectivity program will develop software which will allow the JSTARS Moving Target Indicator (MTI), Fixed Target Indication (FTI) and Synthetic Aperture Radar (SAR) Data to be passed from the JSTARS Common Ground Station (CGS) to lower echelons within the MAGTF. Once the Connectivity Software has been developed, a requirement for a JSTARS CGS software upgrade is anticipated under Joint Program Office Pre-Planned Product Improvement (P3I) initiative.
5. The Coastal Battlefield Reconnaissance and Analysis (COBRA) system is a passive multispectral sensor system capable of operating in a PIONEER unmanned aerial vehicle (UAV). Imagery recorded on the UAV or disseminated via data link is analyzed by the COBRA ground station. Ground station algorithm processing provides near real-time automatic minefield detection with Differential Global Positioning System (DGPS) location accuracy.
6. The TEG is a highly mobile imagery ground station designed to process tactical imagery in support of the MAGTF commander. The system is an integral component of the Joint Service Imagery Processing System (JSIPS), complementing the capabilities of the JSIPS National Input Segment (NIS) located at Camp Pendleton. The system will provide the capability to receive, process, store, exploit, and disseminate Advanced Tactical Air Reconnaissance System (ATARS) electro-optical, infrared, and synthetic aperture radar imagery from the F/A-18D (RC) and receive national secondary imagery from the NIS.

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Budget Item Justification

(Exhibit R-2, Page 22 of 85)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)			DATE	February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE		PROJECT	
7 - Operational System Development	0206313M Marine Corps Communications Systems		C2272	
7. The Counterintelligence (CI) and Human Intelligence (HUMINT) Equipment Program (CIHEP) is an intelligence collection, analysis and reporting suite of equipment, employing commercial-off-the-shelf (COTS) and non-developmental items (NDI) of equipment and software. It will produce digital soft copy as well as hard copy CI, Interrogator-Translator (IT) and HUMINT information reports and images for the Marine Air Ground Task Force (MAGTF) or Joint Force (JTF) Commander. CIHEP will allow for the electronic storage and dissemination of HUMINT information throughout the command, as well as for low volume traditional hard copy dissemination.				
PROGRAM ACCOMPLISHMENTS AND PLANS:				
(U) FY 1999 Accomplishments:				
• (U) \$	188	MANPACK SIDS: Completed software upgrade to maintain NITFS standards and improve compression algorithms.		
• (U) \$	1859	TENCAP: Conducted advance technology demonstrations and integration into the established MAGTF C4I architecture.		
• (U) \$	300	TENCAP: Conducted technical assessments of emerging national data dissemination capabilities.		
• (U) \$	461	TENCAP: Continued to support operational planning to enhance operating force capabilities to US national intelligence data within the MAGTF C4I architecture.		
• (U) \$	437	TENCAP: Evaluated the utility of emerging exploitation, automated and manual target recognition and detection tools.		
• (U) \$	100	TENCAP: Continued TENCAP training and education efforts by providing the Fleet Marine Force with various TENCAP simulation, scripting, and processing hardware and software support.		
• (U) \$	207	JSTARS: Continued analysis, test and exercises with the JSTARS CGS and JSTARS connectivity prototype(s).		
• (U) \$	200	JSTARS: Continued to develop connectivity software.		
• (U) \$	199	CIHEP: Developed ADP, Imagery, Audio and Technical Surveillance capabilities.		
(U)Total \$	3,951			
(U) FY 2000 Planned Program:				
• (U) \$	332	TPC: Initiate test and evaluations.		
• (U) \$	745	TPC: Initiate engineering, manufacturing and development.		
• (U) \$	2300	TPC: Operational systems development.		
• (U) \$	238	TPC: In-house program management.		
• (U) \$	1947	TENCAP: Continue advance technology demonstrations and integration into the established MAGTF C4I architecture.		
• (U) \$	384	TENCAP: Continue technical assessments of emerging national data dissemination capabilities.		
• (U) \$	470	TENCAP: Continue to support operational planning to enhance operating force capabilities to US national intelligence data within the MAGTF C4I architecture.		
• (U) \$	445	TENCAP: Continue to evaluate the utility of emerging exploitation, automated and manual target recognition and detection tools.		
			R-1 Line Item 175	Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)			DATE	February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT		
7 - Operational System Development	0206313M Marine Corps Communications Systems	C2272		
• (U) \$ 125	TENCAP: Continue TENCAP training and education efforts by providing the Fleet Marine Force with various TENCAP simulation, scripting, and processing hardware and software support.			
• (U) \$ 1000	JSTARS: Continue to develop connectivity software.			
• (U) \$ 254	JSTARS: Engineering and technical management support for connectivity software.			
• (U) \$ 1000	JSTARS: Purchase Surveillance Control Data Link (SCDL) for III MEF Field User Evaluation.			
• (U) \$ 148	COBRA: MarCorSysCom program support activities.			
• (U) \$ 350	COBRA: Coastal Systems Station program engineering support.			
• (U) \$ 3030	COBRA: ATD risk reduction verification			
• (U) \$ 995	JSIPS TEG: Develop Full Operational Capability; implement factory system for integration of required software/hardware upgrades.			
(U)Total \$ 13,763				
(U) FY 2001 Planned Program:				
• (U) \$ 147	TPC: Contractor support for Mods.			
• (U) \$ 192	TPC: Perform mods from OT&E			
• (U) \$ 1978	TENCAP: Continue advance technology demonstrations and integration into the established MAGTF C4I architecture.			
• (U) \$ 387	TENCAP: Continue technical assessments of emerging national data dissemination capabilities.			
• (U) \$ 475	TENCAP: Continue to support operational planning to enhance operating force capabilities to US national intelligence data within the MAGTF C4I architecture.			
• (U) \$ 450	TENCAP: Continue to evaluate the utility of emerging exploitation, automated and manual target recognition and detection tools,			
• (U) \$ 126	TENCAP: Continue TENCAP training and education efforts by providing the Fleet Marine Force with various TENCAP simulation, scripting, and processing hardware and software support.			
• (U) \$ 140	COBRA: MarCorSysCom program support activities.			
• (U) \$ 350	COBRA: Coastal systems station program engineering support.			
• (U) \$ 2537	COBRA: Continue ATD risk reduction verification. E&MD design.			
• (U) \$ 390	JSTARS: Continue engineering and technical support for development and integration of connectivity software into joint CGS software baseline.			
• (U) \$ 1462	JSIPS TEG: Continue to develop Full Operational Capability; implement factory system for integration of required software/hardware upgrades.			
(U)Total \$ 8,634				
			R-1 Line Item 175	Budget Item Justification

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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 2000</b>
BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206313M Marine Corps Communications Systems</b>	PROJECT <b>C2272</b>

**D. (U) Schedule Profile:**

*Topographic Production Capability*

*Milestone Schedule*

Fiscal Year	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	Total
Milestones													
CE													
EMD Award													
EMD													
FUE													
Prod Award													
Production													
IOT & E													

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Budget Item Justification

1

DATE **February 2000**

PE NUMBER AND TITLE

**0206313M Marine Corps Communications Systems**

PROJECT  
C2272

(COBRA)

**MILESTONE SCHEDULE**

[illegible]

### Budget Item Justification

**UNCLASSIFIED**



RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	February 2000
BUDGET ACTIVITY										PROJECT	
7 - Operational System Development										C2272	
PE NUMBER AND TITLE										0206313M Marine Corps Communications Systems	
A. (U) Project Cost Breakdown											
a. Program Development Support											
b. Support and Management											
c. Test and Evaluation											
Total											
B. Budget Acquisition History and Planning Information											
Performing Organizations											
Contractor or Government Performing Activity											
Contract Method/Type or Funding Vehicle											
Award or Obligation Date											
Performing Activity EAC											
Project Office EAC											
Total Prior to FY 1999											
FY 1999											
FY 2000											
FY 2001											
Budget to Complete											
FY 2001											
Total Program											
Product Development Organizations											
TENCAP:											
Delfin											
JSTARS:											
TBD											
JSTARS:											
TBD											
JSTARS:											
CECOM, Ft. Mammoth, NJ											
COBRA:											
ERIM INT											
TBD											
TPC:											
MCSC, GSA											
JSIPS TEG											
TBD											
R-1 Line Item 175											
Budget Item Justification											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	February 2000	PROJECT
BUDGET ACTIVITY										PE NUMBER AND TITLE		
7 - Operational System Development										0206313M Marine Corps Communications Systems		
CIHEP:												
NSWC,CRANE,In	MIPR	SEP 99	18	18						18	0	18
IMA, FtMeade,Md	MIPR	SEP 99	51	51						51	0	51
Action Sys,NM	RCP	SEP 99	81	81						81	0	81
McBride, NM	RCP	SEP 99	19	19						19	0	19
B.E. Meyers,WA	RCP	SEP 99	30	30						30	0	30
Support and Management Organizations												
TENCAP:												
Delfin	Various	Oct 97								561	601	CONT
COBRA:									1053			
CSS	WR	Mar 00								350	350	CONT
BRTRC	RCP	Mar 00								148	140	CONT
TPC:												
Logicon	RCP	Mar 00								238	147	CONT
Test and Evaluation Organizations												
SIDS:												
NAWC, PT Mugu	WR	Dec 96	237	237					49	188	0	249
TPC:												
TBD	WR	Mar 00								332	192	CONT
Subtotal Product Development												
Subtotal Support and Management												
Subtotal Test and Evaluation												
Total Project												
										FY 1999	FY 2000	FY 2001
										3202	12100	7204
										561	1331	1238
										188	332	192
										3951	13763	8634
										Budget to	Total	
										Complete	Program	
										CONT	CONT	CONT
										CONT	CONT	CONT
										CONT	CONT	CONT
										CONT	CONT	CONT

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Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 2000	
BUDGET ACTIVITY		PE NUMBER AND TITLE		PROJECT							
7 - Operational System Development		0206313M Marine Corps Communications Systems		C2273							
		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost	
C2273 Air Operations C2 Systems		5985	16324	24780	17889	8519	6690	4045	Continuing	Continuing	
Quantity of RDT&E Articles											
<p>A. (U) <u>Mission Description and Budget Item Justification:</u></p> <p>(U) Air Operations C2 coordinates and plans Navy and Marine air combat operations and interfaces with joint and combined forces air operations. It also interfaces with fire support C2. The systems in this project are used to detect aircraft and missiles, process the detected information, deliver the processed information to the Advanced Tactical Air Command Central (ATACC), and conduct the air battle.</p> <ol style="list-style-type: none"> <li>1. The Tactical Air Operations Module (TAOM) improves the current system; the TAOM is the center for directing aircraft and anti-air systems in real time as part of the joint air battle.</li> <li>2. The Air Defense Communications Platform (ADCP) provides an interface between the AN/TPS-59 (V)3 radar and for tactical ballistic missile defense as a JTIDS network user, the ADCP provides a direct interface between the AN/TPS-59 (v)3 and the joint services.</li> <li>3. The Aviation radar (AV RDR) system is a "congressional mandated" national asset. It is the only fielded ground based sensor which can detect and track Theater Ballistic Missiles at ranges of 400 nautical miles, for 360 degrees up to one million feet in elevation.</li> <li>4. Theater Battle Management Core Systems (TBMCS) provides the commander the automated tools necessary to generate, disseminate and execute the Air Tasking Order (ATO), as mandated by the Chairman, Joint Chiefs of Staff in July 1993. It is an evolutionary acquisition, allowing for the rapid development/fielding of hardware and software to meet today's rapidly advancing technology. It is fielded to all four Marine Tactical Air Command Squadrons (MTACS) and the supporting establishment with Marine Aviation Weapons and Tactics School (MAWTS) and the Battlestaff Training Facility (BSTF) sharing a system. Beginning FY00, CTAPS is migrating to the Theater Battle Management Core Systems (TBMCS) program within the USAF, and will change names from CTAPS to TBMCS.</li> <li>5. The Common Aviation Command and Control System (CAC2S) will provide a common baseline of equipment, computer hardware, and software required to perform the mission of the Marine Air Command and Control System (MACCS). CAC2S will provide a complete and coordinated modernization effort for the equipment of the Marine Air Command and Control System (MACCS) to support its employment in an Operational Maneuver From The Sea (OMFTS) environment. The CAC2S will eliminate the current dissimilar aviation Command &amp; Control systems, and will add the capability for aviation combat direction and air defense functions. CAC2S will be comprised of standardized tactical facilities, hardware, software and will significantly reduce the physical size and logistical footprint of existing MACCS equipment suite. Utilizing common hardware, the CAC2S will be an open architecture system that will migrate to the DII COE. Furthermore, CAC2S will execute real time functions of controlling aircraft and missiles, and employing weapons systems against time critical targets. CAC2S will provide a capability that allows operators to integrate Marine aviation into joint and combined air/ground operations. CAC2S will provide the tools that perform</li> </ol>											

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Budget Item Justification

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## UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT	
7 - Operational System Development	0206313M Marine Corps Communications Systems	C2273	
aviation C2 planning and execution functions in a positive control environment. CAC2S will assimilate the missions and fiscal resources of the Tactical Air Operations Center (TAOM), Tactical Air Command Center and the Direct Air Support Center (DASC) and the Air Defense Communications Platform (ADCP).			
PROGRAM ACCOMPLISHMENTS AND PLANS:			
(U) FY 1999 Accomplishments:			
• (U) \$	443	ADCP: Continued software enhancements concentrating on testing for JTIDS joint certification and a complete VMF development/meshnet upgrades.	
• (U) \$	345	TAOM: Continued closed system (AYK-14) to open system migration.	
• (U) \$	423	TAOM: Continued TMD implementation into the TAOC.	
• (U) \$	186	TAOM: Program support, which consisted of contractor support to provide documentation, hardware/software engineering, and logistics analysis to the program office; support of operational testing, IPR, and contract management.	
• (U) \$	720	AV RDR: Program contractor support.	
• (U) \$	401	AV RDR: Identified false alarm issues by investigation, analysis and test measurement to recommend options to improve radar performance.	
• (U) \$	279	AV RDR: Integrated the AN/TPS-59V(3) into Cooperative Engagement Capability (CEC) network.	
• (U) \$	262	AV RDR: AN/TPS-59 Multichannel Coherent Data Collection System .	
• (U) \$	122	CTAPS: Initiated USMC'S management of Theater Battle Management Core System (TBMCS) 1.0 development	
• (U) \$	650	CAC2S: Program Management Support.	
• (U) \$	1394	CAC2S: Initiated the migration of existing equipment to a Technology Demonstration Laboratory (TDL) as a CAC2S proof on concept for a common suite of equipment; conduct user assessment of TDL for insertion into performance Specification for the EMD phase.	
• (U) \$	760	CAC2S: Conducted exercises and user assessments with laboratory equipment to determine optimum equipment mix and organization.	
(U)Total \$	5,985		
(U) FY 2000 Planned Program:			
• (U) \$	200	ADCP: Complete VMF development/meshnet upgrades.	
• (U) \$	80	ADCP: Continue software modifications.	
• (U) \$	6100	AV RDR: Initiate Safety ECP's developing a replacement IFF Interrogator, maintenance lift, False Alarm Adaptation (FAA) software, and development of software in support of two separate ORDs.	
• (U) \$	750	AV RDR: Forward finances efforts to initiate safety ECP's developing a replacement IFF Interrogator, maintenance lift, False Alarm Adaptation (FAA) software, and development of software in support of two separate ORDs.	
• (U) \$	300	AV RDR: Program in Process Review (IPR), and contract management.	
		R-1 Line Item 175	Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)			DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE	PROJECT	
7 - Operational System Development		0206313M Marine Corps Communications Systems	C2273	
• (U) \$	569	AV RDR: Perform studies and analysis to determine the best approach for upgrading the 59 radar Electronic Protection capability to comply with phase II of the ORD.		
• (U) \$	319	TBMCS: Continue USMC's TBMCS development.		
• (U) \$	25	TBMCS: Continue MCTSSA TBMCS software support.		
• (U) \$	280	TBMCS: Program support to provide documentation, and support of TBMCS development and testing.		
• (U) \$	740	CAC2S: Continue program management support.		
• (U) \$	2242	CAC2S: Continue the migration of existing equipment to a Technology Demonstration Laboratory (TDL) as a CAC2S proof on concept for a common suite of equipment; conduct user assessment of TDL for insertion into Performance Specification for the EMD phase.		
		CompleteConduct initial sensor interface/integration and interoperability testing.		
• (U) \$	2120	CAC2S: Initiate Phase II system engineering, software design and development, and Processing and Display Suite (PDS) efforts for Version I -- Engineering Development Model (EDM).		
• (U) \$	985	CAC2S: Conduct initial sensor interface/integration and interoperability analysis for Version I -- Engineering Development Model (EDM). Ie, integration of Engineering Development Model (EDM) hardware with existing assets and development of shelter configurations.		
• (U) \$	924	CAC2S: Initiate Version I -- Engineering Development Model (EDM) Software development, design, of host processing system, and conduct software integration of Joint mandated applications.		
• (U) \$	690	CAC2S: Initiate integration of Version I -- Engineering Development Model (EDM) hardware with existing assets (to include Communications interface development) and development of shelter configurations.		
(U)Total \$	16,324			
(U) FY 2001 Planned Program:				
• (U) \$	230	ADCP: Continued software enhancements to meet ADCP ORD requirements.		
• (U) \$	0	AV RDR: Initiate safety ECP's developing a replacement IFF Interrogator, maintenance lift, False Alarm Adaptation (FAA) software, and development of software in support of two separate ORDs. This effort forward financed with \$750K of FY00 funding.		
• (U) \$	8557	AV RDR: Antenna obsolescence ECPs to deal with diminishing manufacturing sources issue.		
• (U) \$	500	AV RDR: Counter arm missile defense capability to meet current threats.		
• (U) \$	800	AV RDR: Develop ECP to incorporate IFF antenna into main radar antenna.		
• (U) \$	300	AV RDR: Program in Process Review and contract management.		
• (U) \$	304	TBMCS: Continue USMC's TBMCS development.		
• (U) \$	100	TBMCS: Continue MCTSSA TBMCS software support.		
• (U) \$	230	TBMCS: Program management support.		
• (U) \$	992	CAC2S: Program management support.		
		R-1 Line Item 175		
		Budget Item Justification		

R-1 Line Item 175

Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT	
<b>7 - Operational System Development</b>	<b>0206313M Marine Corps Communications Systems</b>	<b>C2273</b>	
• (U) \$ 1285	CAC2S: Independent Validation & Verification (SPAWAR Systems Center Charleston) of Phase II Contractor's Systems Design, Version I – Engineering Development Model (EDM) Developmental Testing, and Software Configuration Management.		
• (U) \$ 4924	CAC2S: Continue Phase II system engineering, software design and development, and Processing and Display Suite (PDS) efforts for Version I – Engineering Development Model (EDM).		
• (U) \$ 2312	CAC2S: Continue and complete initial sensor interface/integration and begin interoperability testing for Version I – Engineering Development Model (EDM).		
• (U) \$ 2092	CAC2S: Continue Version I – Engineering Development Model (EDM) Software development, design, of host processing system, and conduct software integration of Joint mandated applications.		
• (U) \$ 1652	CAC2S: Continue integration of Version I – Engineering Development Model (EDM) hardware with existing assets (to include Communications interface development) and development of shelter configurations.		
• (U) \$ 502	CAC2S: Begin Version I – Engineering Development Model (EDM) Developmental Testing and Evaluation. Begin development of Version II-EDM following the completion of Version I Developmental Testing and Baseline Stabilization.		
(U)Total \$	24,780		
<b>B. (U) Project Change Summary</b>			
(U) Previous President's Budget		FY 1999	FY 2000
(U) Adjustments to Previous President's Budget		6289	16415
(U) Current Budget Submit		-304	-91
		5985	16324
			24780
(U) Change Summary Explanation:			
(U) Funding: FY99: Decrease in the amount \$67K is due to SBIR taxes and a decrease in the amount of \$208K is due to reprioritization within the Marine Corps. Decrease of \$29K due to NavCompt adjustments. FY00: Decrease in the amount of \$91K due to General Reductions. FY01: Decrease in the amount of \$758K is due to reprioritization of programs within the Marine Corps; decrease of \$55K to NavCompt adjustments; decrease of \$169K is the result of PBD 604; increase of \$13K is the result of PBD 411; and increase of \$2K is due to NWCFC rate adjustments..			
(U) Schedule: N/A			
(U) Technical: N/A			
R-1 Line Item 175		Budget Item Justification	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE									PROJECT
<b>7 - Operational System Development</b>		<b>0206313M Marine Corps Communications Systems</b>									<b>C2273</b>
<b>C. (U) Other Program Funding Summary</b>											
<b>(APPN, BLI #, NOMEN)</b>											
(U) PMC, BLI#464000, TAOM	FY 1999	6,300	FY 2000	0	FY 2001	0	FY 2002	0	FY 2003	0	Total Cost
(U) PMC, BLI#464000, TBMCs		1,462	4,123	3,152	3370	2468	6656	3532	0	0	6,300
(U) PMC, BLI#463700, ADCP		2,096	0	0	0	0	0	0	0	0	CONT
(U) PMC, BLI#462000, ADCP PIP		0	263	279	146	73	60	0	0	0	2,096
(U) PMC, BLI#463600, AN/TPS-59 ECPS		7,687	1,306	1,078	3,789	17493	17,721	10,587	0	0	801
(U) PMC, BLI #463600, AN/TPS-59		0	1,059	0	0	0	0	0	0	0	59661
(U) PMC, BLI #464000, Air Ops Systems CAC2S		0	0	0	0	19,420	43,323	45,320	0	0	1,059
(U) O&M, ADCP		54	154	42	0	0	0	0	0	0	CONT
(U) O&M, CAC2S		1767	1762	1675	0	0	0	0	0	0	0
(U) O&M, CTAPS		1179	390	1148	0	0	0	0	0	0	566
<b>(U) Related RDT&amp;E</b>											
<b>PE 0603216C (Ballistic Missile Defense Organization, Theater Missile Defense)</b>											

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Budget Item Justification

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ROD&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE February 2000

BUDGET ACTIVITY

7 - Operational System Development

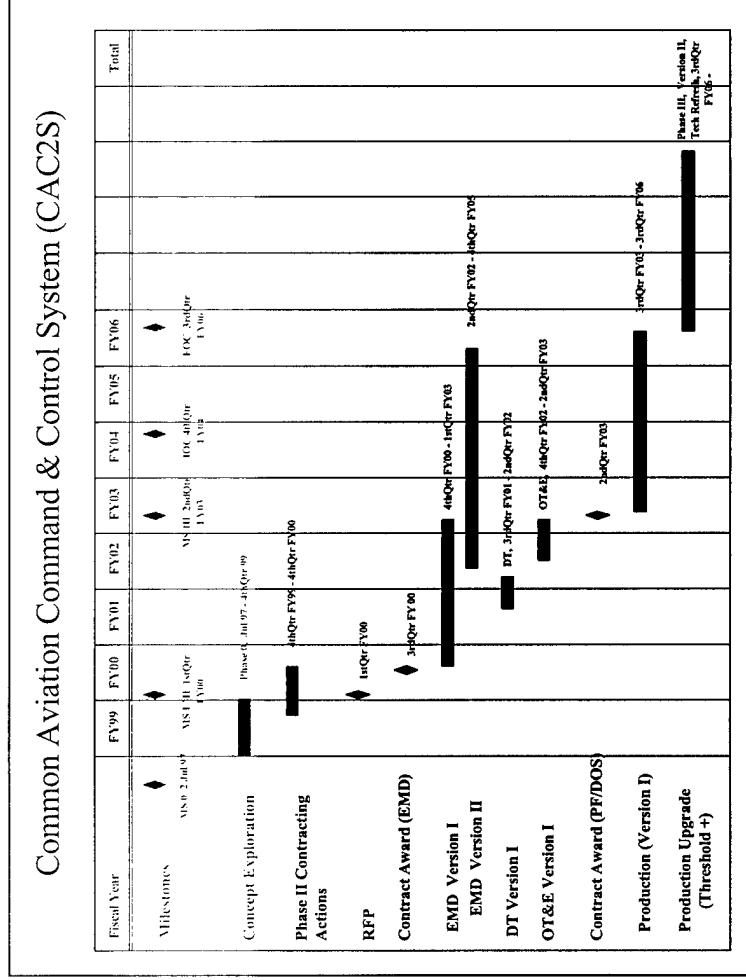
PE NUMBER AND TITLE

0206313M Marine Corps Communications Systems

PROJECT  
C2273

D. (U) CAC2S Milestone Schedule Profile

CAC2S Schedule:



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Budget Item Justification

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<b>ROT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		<b>DATE</b> February 2000	<b>PROJECT</b> C2273
<b>BUDGET ACTIVITY</b> <b>7 - Operational System Development</b>	<b>PE NUMBER AND TITLE</b> 0206313M Marine Corps Communications Systems		
TPS-59 RADAR SCHEDULE:			
(V)3 Fielding Schedule: IOC: FOC:	3 <sup>rd</sup> Qtr 98 thru 3 <sup>rd</sup> Qtr 99 Sep 98 Aug 99		
CEC Integration: Develop: IV&V:	1 <sup>st</sup> Qtr 99 thru 4 <sup>th</sup> Qtr 00 1 <sup>st</sup> Qtr 99 thru 3 <sup>rd</sup> Qtr 00 3 <sup>rd</sup> Qtr 99 thru 4 <sup>th</sup> Qtr 00		
Antenna Obsolescees ECP's: Procure (Various): IOC: FOC:	1 <sup>st</sup> Qtr 99 thru 3 <sup>rd</sup> Qtr 04 1 <sup>st</sup> Qtr 99 thru 4 <sup>th</sup> Qtr 03 2 <sup>nd</sup> Qtr 01 3 <sup>rd</sup> Qtr 04		
<b>R-1 Line Item 175</b>		<b>Budget Item Justification</b> (Exhibit R-2, Page 36 of 85)	

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BUDGET ACTIVITY				PE NUMBER AND TITLE				DATE	PROJECT
7 - Operational System Development				0206313M Marine Corps Communications Systems				February 2000	C2273
<b>A. (U) Project Cost Breakdown</b>				FY 1999	FY 2000	FY 2001			
Software Development				441	262	5830			
System Migration				1635	0	0			
System Development				2435	9823	10048			
Program Support				1352	1773	1358			
Management Development				122	0	0			
Software Support				0	24	100			
Processing/Display Suite				0	2120	2267			
System Integration				0	1632	3477			
Communication Package				0	690	1700			
Total				5985	16324	24780			
<b>B. Budget Acquisition History and Planning Information</b>									
<b>Performing Organizations</b>									
Contractor or	Method/Type	Award or	Performing	Project	Total				
Government	e or Funding	Obligation	Activity	Office	Prior to				
Activity	Vehicle	Date	EAC	EAC	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
<b>Product Development Organizations</b>									
<b>CAC2S:</b>									
Center Charleston, SC	WR	Apr 99	6918	6918	0	2500	1196	980	6918
TBD	RCP	May00	31776	31776	0	0	10979	16078	31776
<b>ADCP:</b>									
NSWC Crane, IN	WR	May 99			100	345	120	CONT	CONT
TAOM: MCSC Quantico, VA	RCP	Mar 99	1336	1336	1016	320	0	0	1336
R-1 Line Item 175				Budget Item Justification					

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RTRE PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)									
BUDGET ACTIVITY		PE NUMBER AND TITLE						DATE	PROJECT
7 - Operational System Development		0206313M Marine Corps Communications Systems						February 2000	C2273
MCSC	RCP	Apr 99	31	31	0	31	0	0	31
Quantico, VA									
MCSC	RCP	Apr 99	421	421	0	421	0	0	421
Quantico, VA									
AV RADAR:									
Lockheed	FFP	Oct 96			2956	893	6806	9377	CONT
Martin, Syracuse NY									CONT
Sensis Corp.	C/CPEF	Nov 98			0	279	176	200	CONT
Syracuse, NY									CONT
MCSC	RCP	Sep 99	262	262	0	262	0	0	262
Quantico, VA									
TBMCS:									
MARCORSYSCOM	WR	May 99	90	90	0	90	0	0	90
ESC	MIPR	Feb 99			0	5	319	308	CONT
Hanscom AFB, MA									CONT
Support and Management Organizations									
CAC2S:									
MARCORSYSCOM	WR	Mar 99	818	818	0	28	90	100	600
Logicon	IDIQ	Oct 98			0	0	600	832	CONT.
MCTSSA, Camp	WR	Apr 99	310	310	0	20	30	40	220
Pendleton, CA									310
MCLB Albany GA	WR	Mar 99	196	196	0	6	20	20	150
3rd MAW	WR	Apr 99	8	8	0	8	0	0	8
San Diego, CA									
SPAWAR	WR	Nov 98	100	100	0	100	0	0	100
Charleston, SC									
CG 1st MAW	WR	Feb 99	9	9	0	9	0	0	9
2nd MAW	WR	Nov 98	1	1	0	1	0	0	1
Cherry Pt, NC									
MarForRes	WR	Dec 98	1	1	0	1	0	0	1
New Orleans, LA									
		R-1 Line Item 175						Budget Item Justification	

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## UNCLASSIFIED

ENTER PROJECT COST BREAKDOWN (P.3)

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## BUDGET ACTIVITY

## 7 - Operational System Development

PE NUMBER AND TITLE

0206313M Marine Corps Communications

# Systems

PROJECT

C2273

	RCP	May 99	124	0	124	0	0	0	0	0	124
MCS Quantico, VA											
MCA Yuma, AZ	WR	Mar 99	7	7	0	0	0	0	0	0	7
ADP:											
MAGC Palms, CA	WR	May 99	2	2	0	0	0	0	0	0	2
MCLB Albany, GA	WR	Oct 98	4	4	0	0	0	0	0	0	4
MCTSA Camp Pendleton, CA	WR	Jan 99			0	100	20	80	CONT.	CONT.	CONT.
MARCOMSYSCOM	WR	Jan 99			0	30	17	30	CONT	CONT	CONT
TAOM:											
MCTSA	WR	Feb 99	86	86	0	0	0	0	0	0	86
MCTSA	RCP	Jun 99	96	96	0	0	0	0	0	0	96
AVRADAR:											
NSWC Crane, IN	WR	May 99			0	38	48	50	CONT	CONT	CONT
MCTSA Camp Pendleton, CA	WR	Dec 99			0	20	0	50	CONT.	CONT.	CONT.
MCLB Albany, GA	WR	Dec 99			0	20	0	20	CONT	CONT	CONT
NRL Washington, DC	WR	Jan 99			0	208	119	0	CONT.	CONT.	CONT.
Logicon, Stafford, VA	CPFF	Dec 99			0	451	0	460	CONT	CONT	CONT
2 <sup>ND</sup> MAW	WR	Jan 99	1	1	0	0	1	0	0	0	1
NSWC Dahlgren, VA	WR	May 99	60	60	0	0	60	0	0	0	60

**R-1 Line Item 175**

### Budget Item Justification

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BUDGET ACTIVITY										PE NUMBER AND TITLE		DATE		PROJECT	
7 - Operational System Development										0206313M Marine Corps Communications Systems		February 2000		C2273	

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Budget Item Justification

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BUDGET ACTIVITY		PE NUMBER AND TITLE										DATE	
7 - Operational System Development		0206313M Marine Corps Communications Systems										PROJECT C2274	
C2274	C2 Warfare Systems	COST (In Millions)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost		
	Quantity of RDT&E Articles		3191	10329	2663	4290	4930	3119	3319	Continuing	Continuing		
<p><b>A. (U) Mission Description and Budget Item Justification:</b></p> <p>(U) Command and Control (C2) Warfare Project includes the following tactical electronic intercept, direction finding, and electronic attack systems:</p> <ol style="list-style-type: none"> <li>1. The Tactical Electronic Reconnaissance Processing and Evaluation System (TERPES) is used to process, sort, analyze, display and correlate ES and EA data collected by EA-6B aircraft and maintains the Tactical Electronic Orders of Battle.</li> <li>2. The Mobile Electronic Warfare Support System, Product Improvement Program (MEWSS-PIP) will be used to collect and process communication and non-communication signals and provide electronic attack capability from a mobile ground platform.</li> <li>3. Team Portable collection System (TPCS) upgrade is a semi-automated, manpackable/team transportable signals intelligence system that provides communications intercept, radio direction finding analysis and reporting to the Marine Air Ground Task Force (MAGTF) Commander.</li> <li>4. The Radio Reconnaissance Equipment Program (RREP) provides the FMF Radio Battalions, Radio Reconnaissance Platoons (RRP) with mission unique Signals Intelligence/Ground Electronic Warfare SIGINT/EW Equipment suites. Continuing with an evolutionary acquisition approach, the third suite RREP-SS-2 will provide the RRP's with the capability to conduct SIGINT/EW operations in support of Marine Air Ground Task Force (MAGTF) Commanders during advance force special operations, and other special purpose missions where the use of conventional Radio Battalion assets are not feasible. RREP-SS-2 is a ruggedized, modular, man packable system specifically designed utilizing emerging NDI/COTS/GOTS technology for RRP operations, particularly those conducted under the most austere conditions. The RREP-SS-2 module configuration has an "open systems" architecture that will permit future upgrades by simply installing cutting edge NDI/COTS/GOTS technology into the standard modules. The fourth suite, RREP-SS-3, to be fielded in FY04, will have the added capability to intercept those emerging target sets as identified by the NSA, be operated from remoted positions, and incorporate polymer battery technologies.</li> </ol>													
R-1 Line Item 175										Budget Item Justification			

## UNCLASSIFIED

# TOTAL BUDGET ITEM JUSTIFICATION SHEET (R-2 EXHIBIT)

DATE

February 2000

BUDGET ACTIVITY

7 - Operational System Development

PE NUMBER AND TITLE

0206313M Marine Corps Communications

Systems

PROJECT

C2274

## PROGRAM ACCOMPLISHMENTS AND PLANS:

### (U) FY 1999 Accomplishments:

- (U) \$ 128 MEWSS: Developed performance enhancing ECP for Electronic Attack integration.
- (U) \$ 57 MEWSS: Developed performance enhancing ECP for SATCOM radio integration.
- (U) \$ 275 TPCS Upgrade: Transitioned TPCS Upgrade 2.0 Software to Defense Information Infrastructure (DII) Common Operating Environment (COE).
- (U) \$ 200 TPCS Upgrade: Initiated Software revisions to TPCS Upgrade 2.0 software.
- (U) \$ 290 TPCS Upgrade: Initiated Hardware revisions to TPCS Upgrade. Achieve MSILL.
- (U) \$ 230 TPCS Upgrade: Continuing Systems Engineering and Technical Assistance (SETA).
- (U) \$ 739 TERPES: Continuing the development of TERPES mission planning software to maintain compatibility with the EA-6B aircraft software changes.
- (U) \$ 142 TERPES: Continuing the development of Tactical Automation Sanitation capability or similar Multi-Level Security (MLS) device or procedure.
- (U) \$ 400 TERPES: Continuing software development of Link 16 TADIL J (IBS) to be incorporated into fusion processor.
- (U) \$ 133 TERPES: Began development of advanced communication suite upgrade for Joint interoperability software changes.
- (U) \$ 480 TERPES: Began DII/COE compliance to reach level 6.
- (U) \$ 117 TERPES: Began Sensitive Secret Compartmented Information (SCI) accreditation and NT migration.
- (U)Total \$ 3191

### (U) FY 2000 Planned Program:

- (U) \$ 1800 MEWSS PIP: Complete integration of Electronic Attack subsystem.
- (U) \$ 160 MEWSS PIP: Forward finances completion of the integration of the Electronic Attack module.
- (U) \$ 4513 MEWSS PIP: Final integration and developmental testing
- (U) \$ 816 TPCS Upgrade: In keeping with the evolutionary acquisition strategy, these funds will be used to develop software to enhance the baseline Including enhancements to improve the systems interoperability with other systems.
- (U) \$ 195 TPCS Upgrade: Systems Engineering and Technical Assistance (SETA).
- (U) \$ 500 TERPES: Continue development of TERPES mission planning software to maintain compatibility with the EA-6B aircraft software changes.
- (U) \$ 200 TERPES: Continue development of Tactical Automation Sanitation capability or similar Multi-Level Security (MLS) device or procedure.
- (U) \$ 100 TERPES: Forward finances the commencement and completion of software and hardware integration for Joint Tactical Terminal (JTT).
- (U) \$ 538 TERPES: Continue DII/COE compliance to reach level 6 and NT migration.

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Budget Item Justification

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BUDGET ACTIVITY		PE NUMBER AND TITLE	DATE	PROJECT
7 - Operational System Development		0206313M Marine Corps Communications Systems	February 2000	C2274
• (U) \$	31	TERPES: Forward finances the continuation of DII/COE compliance to reach level 6 and NT migration.		
• (U) \$	397	TERPES: Continue development of advanced communications suite for Joint interoperability software changes.		
• (U) \$	500	TERPES: Forward finances the beginning of Enhanced TERPES Fusion Correlator Software.		
• (U) \$	579	RREP: Integrate GOTS/COTS electronic attack (EA) capability (SS-2).		
(U)Total \$	10,329			
(U) FY 2001 Planned Program:				
• (U) \$	134	MEWSS PIP: USMC cost-share of multi-service program development of performance-enhancing ECP for targeting of additional COMINT emitter types.		
• (U) \$	315	MEWSS PIP: Development of performance-enhancing ECP for TACJAM analyzer upgrade insertion, allowing increased signals analysis capability.		
• (U) \$	0	MEWSS PIP: Complete integration of Electronic Attack module. This effort forward financed with \$160K of FY00 funding.		
• (U) \$	197	TPCS Upgrade: Systems Engineering and Technical Assistance(SETA).		
• (U) \$	131	TPCS Upgrade: These funds will be used to fund development of further system enhancements including for software and later upgrades.		
• (U) \$	0	TERPES: Begin and complete software and hardware integration for Joint Tactical Terminal (JTT). This effort forward financed with \$100K of FY 00 funding.		
• (U) \$	467	TERPES: Continue development of TERPES mission planning software to maintain compatibility with the EA-6B software changes.		
• (U) \$	100	TERPES: Continue development of advanced communications suite for Joint Interoperability hardware/ software changes.		
• (U) \$	459	TERPES: Continue DII/COE compliance to reach level 6.		
• (U) \$	0	TERPES: Continue DII/COE compliance to reach level 6 and NT migration. This effort forward financed with \$31K of FY00 funding.		
• (U) \$	275	TERPES: Begin enhanced TERPES Fusion Engine Software.		
• (U) \$	0	TERPES: Begin enhanced TERPES Fusion Correlator Software.		
• (U) \$	366	TERPES: Continue to enhance TERPES Fusion Correlator Software. This effort forward financed with \$500K of FY00 funding.		
• (U) \$	219	RREP: Development efforts in support of remote control operations (SS-3).		
(U)Total \$	2663			

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Budget Item Justification

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BUDGET ACTIVITY		PE NUMBER AND TITLE										DATE	PROJECT
7 - Operational System Development		0206313M Marine Corps Communications Systems										FEBRUARY 2000	C2274
<b>B. (U) Project Change Summary</b>			FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost		
(U) Previous President's Budget			3939	8387	3504								
(U) Adjustments to Previous President's Budget			-748	+1942	-841								
(U) Current Budget Submit			3191	10329	2663								
(U) Change Summary Explanation:													
(U) Funding: FY99 decrease of \$748K is due to SBIR assessment, reprioritization of programs within the Marine Corps, and other minor program changes. FY00 and FY01 increases are due to reprioritization of programs within the Marine Corps and other minor program changes.													
(U) Schedule: N/A													
(U) Technical: N/A													
<b>C. (U) Other Program Funding Summary</b>			FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost		
(U) (APPN, BLI #, NOMEN)													
(U) PMC BLI 474900 Modification Kits INTEL			0	3669	0	2700	0	2680	0				
TERPES													
(U) PMC BLI 463600 Modification Kits MEWSS			21053	7914	4939	33294	32782	7482	0	0	107464		
(U) PMC BLI 474900 Modification Kits INTEL			24	11278	2833	0	0	2467	2075	0	18677		
TPCS													
(U) PMC BLI 474700 Intelligence Support			0	2841	0	0	3901	0	0	0	6742		
EQUIPMENT RREP													
(U) O&M													
TERPES			2141	1967	1957					CONT	CONT		
TPCS			1203	2293	2024					CONT	CONT		
MEWSS			819	841	810					CONT	CONT		
<b>(U) Related RDT&amp;E</b>													
(U) (U) PE 0305885G (Tactical Cryptologic Program)													

R-1 Line Item 175

Budget Item Justification

(Exhibit R-2, Page 44 of 85)

UNCLASSIFIED

BUDGET ACTIVITY		DATE		PROJECT	
7 - Operational System Development		02000313M Marine Corps Communications Systems		C2274	
<p><b>D. (U) Schedule Profile</b></p> <p><b>MEWSS</b></p> <p><b>Schedule</b></p>					
<p align="center"><b>MEWSS-PIP</b></p> <p align="center"><b>MILESTONE SCHEDULE</b></p>					
PHASE	FY	FY	FY	FY	FY
MILESTONE 0	98	99	00	01	02
MILESTONE I/II					
PHASE I OT					
PHASE II OT					
MILESTONE III					
PRODUCTION CONTRACT AWARD					
PRODUCTION					
IOC					
FOC					

R-1 Line Item 175

Budget Item Justification

(Exhibit R-2, Page 45 of 85)

UNCLASSIFIED

BUDGET ACTIVITY	PE NUMBER AND TITLE	DATE
7 - Operational System Development	0206313M Marine Corps Communications Systems	February 2000
		PROJECT C2274

TPCS Schedule

TPCS UPGRADE MILESTONE SCHEDULE						
PHASE	FY 98	FY 99	FY 00	FY 01	FY 02	
MILESTONE 0						
MILESTONE I/II						
OT		X				
MILESTONE III		X				
PRODUCTION CONTRACT AWARD			X			
PRODUCTION			X			
IOC				X		
FOC					X	

R-1 Line Item 175

Budget Item Justification

(Exhibit R-2, Page 46 of 85)

UNCLASSIFIED

BUDGET ACTIVITY		DATE	
7 - Operational System Development		February 2000	
PROJECT		PROJECT	
02060313M Marine Corps Communications		C2274	
Systems			

RREP SCHEDULE:

## R R E P M I L E S T O N E S C H E D U L E

P H A S E	F Y	F Y	F Y	F Y	F Y	F Y
M S I I ( S S - 2 )	9 8	9 9	0 0	0 1	0 2	
M S I I I ( S S - 2 )	2 Q					
E L E C T R O N I C A T T A C K ( E A M O D U L E )			1 Q			
M S 0 / I ( S S - 3 )			3 Q			
R E M O T E E A C A P A B I L I T Y			4 Q			
I O C / F O C ( S S - 2 )				2 Q		
M S I I ( S S - 3 )				3 Q		
M S I I I ( S S - 3 )				3 Q		
					4 Q	

R-1 Line Item 175

Budget Item Justification

(Exhibit R-2, Page 47 of 85)

UNCLASSIFIED



BUDGET ACTIVITY		PE NUMBER AND TITLE		DATE		PROJECT	
7 - Operational System Development		0206313M Marine Corps Communications		February 2000		C2274	
Support and Management Organizations		Systems					
TPCS Upgrade:							
CSC	CPFF	Oct 97	0	187	195	197	CONT
TERPES:							
NAWCWPNS, Pt Mugu, CA	WR	Oct 99	0	97	90	92	CONT
Test and Evaluation Organizations							
MEWSS:							
MARTIN FED LOCKHEED SYS, OWEGO	CPFF	FEB 00	0	0	4513	0	4513
Subtotal Product Development							
Subtotal Support and Management							
Subtotal Test and Evaluation							
Total Project							

## UNCLASSIFIED

BUDGET ACTIVITY		PE NUMBER AND TITLE		PROJECT						
7 - Operational System Development		0206313M Marine Corps Communications		C2276						
		Systems								
COST (In Millions)		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
C2276	Communications Switching and Control Systems	1538	1831	227	0	0	0	0	0	3596
Quantity of RDT&E Articles										

## A. (U) Mission Description and Budget Item Justification:

(U) This program consists of three interrelated projects: Digital Technical Control (DTC), Tactical Data Network (TDN), and Defense Message System (DMS). Together, these systems form an integrated, digital communications backbone for a deployed Marine Air Ground Task Force (MAGTF) which has the capability to manage, control, switch, and multiplex networks providing voice, data, message, imagery, facsimile, and video services to subscribers.

1. (U) The TDN augments existing MAGTF communications infrastructure to provide the commander an integrated data network forming the communication backbone for MAGTF tactical data systems and Defense Message System. The TDN consists of a network of Gateways and Servers interconnected with one another and their subscribers via a combination of common user long-haul transmission systems, local area networks, single channel radios, and the switched telephone system. The network provides its subscribers with basic data transfer and switching services; access to strategic, supporting establishment, joint, and other service component tactical data networks; network management capabilities; and value-added services such as message handling, directory services, file sharing, facsimile handling, and terminal emulation support. Required functionality was separated into three blocks of capabilities due to the leading edge technology required in the Operational Requirement Document (ORD). This evolutionary acquisition strategy and funding provide for development of additional capabilities which compose the Block II upgrade of the system.
2. (U) The DTC facilitates the installation, operation, restoration, and management of individual circuits and digital links consisting of many multiplexed circuits. It provides the primary interface between subscriber systems/networks within a local area and long-haul multichannel transmissions systems to transport voice, message, data, and imagery traffic. It can add, drop and insert digital circuits into multiplexed groups; provide a source of stable timing to connected equipment; condition circuits; and perform analog/digital, 2-wire/4-wire, and signaling conversions. It contains the monitoring, testing, and patching equipment required by technical controllers to troubleshoot and restore faulty circuits and links. This funding provides for the development of interfaces to new technology transmission systems.
3. (U) DMS is an OSD-mandated program to integrate Automatic Digital Network (AUTODIN) and E-Mail into a single, secure, DoD message communications system. DMS will expand writer-to-reader connectivity, support, and message security services. Organizations and individuals will be able to create, edit, send, receive, read, and process organizational and individual messages, secured with end-to-end protection, direct from desktop terminals/personal computers in their workspaces. DMS will do everything our current Banyan E-Mail and AUTODIN systems do with the following additional capabilities: connectivity to all users in DoD.

R-1 Line Item 175

Budget Item Justification

(Exhibit R-2, Page 50 of 85)

## UNCLASSIFIED

## UNCLASSIFIED

BUDGET ACTIVITY		DATE	
7 - Operational System Development		PROJECT	
		02276	
PE NUMBER AND TITLE		0200313M Marine Corps Communications	
Systems			
<p><b>PROGRAM ACCOMPLISHMENTS AND PLANS:</b></p> <p>(U) FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> <li>• (U)\$ 338 DTC: Engineering/testing system technology upgraded.</li> <li>• (U)\$ 315 DMS: Supported software and hardware integration/testing. Incorporated evolutionary security products into the unclassified DMS architecture within a Marine Corps-unique network infrastructure.</li> <li>• (U)\$ 885 TDN: Developed TDN Block II and software/hardware integration/testing.</li> <li>(U)Total\$ 1,538</li> </ul> <p>(U) FY 2000 Planned Program:</p> <ul style="list-style-type: none"> <li>• (U) \$ 547 DTC: Developmental/Interoperability testing of ATM upgrade, obtain approval for ATM upgrade</li> <li>• (U) \$ 196 DMS: Support software and hardware integration/testing. Incorporate evolutionary security products into the unclassified DMS architecture within a Marine Corps-unique network infrastructure.</li> <li>• (U) \$ 1088 TDN: Continue TDN BLK II development and S/W and H/W Intergration testing. Achieve milestone III Decision for Block II</li> <li>(U)Total \$ 1,831</li> </ul> <p>(U) FY 2001 Planned Program:</p> <ul style="list-style-type: none"> <li>• (U) \$ 227 DMS: Support software and hardware integration/testing. Incorporate evolutionary security products into the unclassified DMS architecture within a Marine Corps-unique network infrastructure.</li> <li>(U)Total \$ 227</li> </ul> <p><b>B. (U) Project Change Summary</b></p> <p>(U)Previous President's Budget 1888 FY 1999 1841 FY 2000 229 FY 2001</p> <p>(U)Adjustments to Previous President's Budget -350 -10 -2</p> <p>(U)Current Budget Submit 1538 1831 227</p> <p>(U) Change Summary Explanation:</p> <p>(U) Funding: FY99 decrease in the amount of \$34K for SBIR tax assessment. FY99 decrease in the amount of \$316K is due to reprioritization of programs within the Marine Corps.</p> <p>(U) Funding: FY00 decrease in the amount of (\$10k) minor inflation adjustment.</p> <p>(U) Funding: FY01 decrease in the amount of (\$2k) minor inflation adjustment.</p>			
R-1 Line Item 175		Budget Item Justification	

(Exhibit R-2, Page 51 of 85)

## UNCLASSIFIED





UNCLASSIFIED

EXHIBIT R-2, INFORMATION GLEET (R-2) EXHIBIT R-2

DATE

BUDGET ACTIVITY

7 - Operational System Development

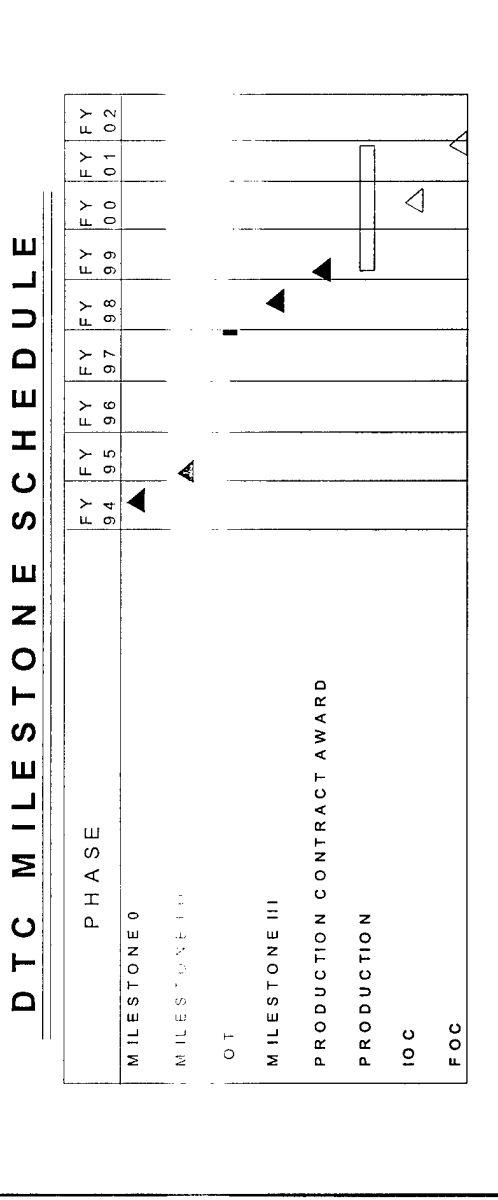
PE NUMBER AND TITLE

0206313M Marine Corps Communications Systems

PROJECT  
C2276

D. (U) Schedule Profile:

DTC Schedule



R-1 Line Item 175

Budget Item Justification

(Exhibit R-2, Page 53 of 85)

UNCLASSIFIED

7 - Operational System Development

BUDGET ACTIVITY

PE NUMBER AND TITLE

0200013M Marine Corps Communications

Systems

DATE

PROJECT  
C2276

TDN Schedule

## Tactical Data Network (TDN)

### TDN MILESTONE SCHEDULE

PHASE	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
MILESTONE 0	▲								
MILESTONE I/II		▲			▲				
BLOCK I OT					▲				
MILESTONE III					▲				
PRODUCTION CONTRACT AWARD					▲				
BLOCK I FIELDDED						▲			
BLOCK II FIELDDED							▲		
BLOCK III FIELDDED								▲	
IOC							▲		
FOC								▲	

R-1 Line Item 175

Budget Item Justification

(Exhibit R-2, Page 54 of 85)

UNCLASSIFIED

BUDGET ACTIVITY 7. Operational System Development	BUDGET ITEM IDENTIFICATION QUESTIONS PROJECT C2270 020001001 Marine Corps Communications	DATE
<b>Systems</b>		

PHASE	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01
MAISRC I/II	△							
SBU IOC				^				
IOT&E				△				
MAISRC IPR				△				
Secret IOC				△				
TS/SCI IOC					△			
MAISRC III						△		
SBU FOC							△	
Secret FOC							△	
TS/SCI FOC							△	

DMS Schedule	R-1 Line Item 175	Budget Item Justification (Exhibit R-2, Page 55 of 85)
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**UNCLASSIFIED**

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

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# Systems

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**A. (U) Mission Description and Budget Item Justification:**

PHD provides funds for engineering, test, and evaluation activity. ACH ensures that the systems being developed within the Program Executive Office (PEO) employ consistent standards for interoperability and, to the maximum extent feasible, use hardware and software which is uniform across programs.

1. The Marine Air-Ground Task Force Command, Control, Communications, Computers, and Intelligence Systems Engineering and Integration, Coordination. (MAGTF C4I SE&IC) subproject is a non-acquisition effort which provides centralized planning and execution of MAGTF C4I Systems; it develops, published and manages configuration of the MAGTF C4I Systems/Technical Architecture and its implementation; it is also used to develop and test common hardware and software for use in MAGTF C4I Systems; MAGTF C4I SE&I also funds USMC participation in joint planning and technical standards development. MAGTF SE&IC changes name to MAGTF SEI&C in FY00.
2. Joint Warrior Interoperability Demos (JWID) is a JCS-mandated program to demonstrate new C4I interoperability concepts for the warrior. JWID offers the opportunity for demonstrations of evolving technologies in interoperability, information dissemination, fusing and digital communications.
3. The Joint Interoperability of Tactical Command and Control Systems (JINTACCS) is a Joint Chiefs-of-Staff (JCS)-mandated program for joint development, implementation, and testing of data links under the direction of the Joint Interoperability Engineering Organization (JIEO).
4. Common Computer Resources mission – Central and standardized management and acquisition of all common computer hardware and infrastructure adopting the Joint Defense Information Infrastructure (DII) Common Operating Environment (COE) with consolidated Integrated Logistics Support. Ensure the environment remains in synchronization with computer hardware technology hardware improvements. The mission supports the Commandant's Planning Guidance and input to the Marine Corps Master Plan.

**R-1 Line Item 175**

### Budget Item Justification

(Exhibit R-2, Page 56 of 85)

**UNCLASSIFIED**

# UNCLASSIFIED

## BUDGET ITEM JUSTIFICATION SHEET (BJJ EXHIBIT)

DATE

7 - Communications System Development

7 - Communications System Development

7 - Communications System Development

Systems

PROJECT  
NUMBER  
022777

### PROGRAM ACCOMPLISHMENTS AND PLANS:

#### (U) FY 1999 Accomplishments:

- (U) \$ 2117 MAGTF SEI&C: Initiated Independent Verification and Validation (IV&V) to certify that all MAGTF C4I systems are Year 2000 compliant. Improved MCRSSA Battlelab facilities to conduct IV&V testing.
- (U) \$ 7209 MAGTF SEI&C: Continued to provide engineering and technical support for configuration management of the MAGTF C4I system and its migration to the DII COE. Started the MAGTF C4I Systems/Technical Architecture Repository (MSTAR) that will provide technical roadmap to MAGTF systems development and aid in its configuration management. This effort assisted UOC and AAV programs with engineering analysis. Developed individual description of USMC Tactical Internet. Continued to provide systems engineering efforts to implement the emerging Joint Architecture. Provided interoperability testing/certification of MAGTF C4I systems. Participate in the development of the Joint ASCIET Program and conduct yearly ASCIET combat identification evaluations.
- (U) \$ 120 JINTACCS: Supported the JINTACCS program by providing system engineering efforts to implement emerging standard and provided interoperability testing/certification of MAGTF C4I systems.
- (U) Total \$ 9,446

#### (U) FY 2000 Planned Program:

- (U) \$ 1372 JWID: Provide management, engineering and technical support in preparation for JWID-00, a JCS-mandated program. JWID offers the opportunity to demonstrate and evaluate emerging technologies.
- (U) \$ 1338 JINTACCS: Participate in JINTACCS, a JCS-mandated program aimed at ensuring interoperability of tactical systems. Provide analysis, engineering and technical support in developing joint standards. Provides interoperability testing/certification in support of C4I systems. Provide technical support in various joint programs and ACTD's.
- (U) \$ 2593 MAGTF SEI&C: Provide engineering and technical support for configuration management of MAGTF C4I system and its migration to the DII COE. Provide analysis, studies and reviews in the development and implementation of the COE migration strategy. Continue MSTAR architecture development, with emphasis on UOC and AAV support. Support D-30 process to integrate Marine C4I systems onto amphibious ships for MEU deployments. Provide engineering support for remaining Y2K problems within MAGTF C4I systems. Provide USMC share of ASCIET exercise per established MOA.
- (U) \$ 177 MAGTF SEI&C: Forward finances engineering and technical support for configuration management of MAGTF C4I system and its migration to the DII COE.
- (U) \$ 1676 CCR MCHS: Provide for research, evaluation, test and selection of computer hardware products for the Marine Corps Common Hardware Suite (MCHS). Develop MCHS system specifications and baselines; research and analyze computer technologies and hardware; conduct performance, compatibility and environment testing; support commercial product selection and application.

R-1 Line Item 175

Budget Item Justification

(Exhibit R-2, Page 57 of 85)

# UNCLASSIFIED

## UNCLASSIFIED

## R-1 Line Item Justification Sheet (R-1 E-11A)

DATE

7-0 Computer System Development

020001001 Marine Corps Communications

02211

## Systems

(U)Total \$ 7,156

## (U) FY 2001 Planned Program:

- (U) \$ 1404 JWID: Participate in JWID, a JCS-mandated program, to demonstrate new C4I interoperability concepts. In JWID-01, USMC is the service lead, it will conduct primary planning equipment preparation, and hosting. JWID-01 offers the opportunity for demonstrations of emerging technologies in interoperability, information dissemination, fusing and communications.
- (U) \$ 1094 JINTACCS: Participate in JINTACCS, a JCS-mandated program aimed at ensuring interoperability of tactical systems. Provide analysis, Engineering and technical support in developing joint standards. Provides interoperability testing/certification in support of C4I systems. Provide technical support in various joint programs and ACTD's.
- (U) \$ 2300 MAGTF SEI&C: Provide engineering and technical support for configuration management of MAGTF C4I systems and its migration to the DII COE. Maintain MISTAR system. Provide support to MAGTF C4I system integration. Provide an engineering and technical review in the development and implementation of the COE migration strategy. Analyze the movement of MAGTF C4I systems to joint standards to mandated levels and provide technical recommendations to correct deficiencies. Continue engineering support to D-30 Amphib Ready Group (ARG) preparation process. Provide USMC fair share of ASCIET exercise per established MOA.
- (U) \$ 0 MAGTF SEI&C: Provide engineering and technical support for configuration management of MAGTF C4I system and its migration to the DII COE. This effort forward financed with \$177K of FY00 funding.
- (U) \$ 1626 CCR MCHS: Provide for research, evaluation, test and selection of computer hardware products for the Marine Corps Common Hardware Suite (MCHS). Develop MCHS system specifications and baselines; research and analyze computer technologies and hardware; conduct performance, compatibility and environmental testing; support commercial product selection and application.

(U)Total \$ 6,514

R-1 Line Item 175

Budget Item Justification

(Exhibit R-2, Page 58 of 85)

UNCLASSIFIED

UNCLASSIFIED

BUDGET ITEM JUSTIFICATION SHEET (B-2 Exhibit)

DATE

February 2000

Program Title: National System Development

Program Number: 0206623M, Marine Corps Communications

Page: 02277

Systems

B. (U) Project Change Summary

(U) Previous President's Budget  
(U) Adjustments to Previous President's Budget  
(U) Current Budget Submit

	FY 1999	FY 2000	FY 2001
	7155	6966	6762
	+2291	+190	-248
	9446	7156	6514

(U) Change Summary Explanation:

(U) Funding: FY99 adjustment is due to an increase of \$2,291K due to reprioritization of programs within the Marine Corps. FY00 increase of \$190K and FY01 decrease of \$248K are due to reprioritization of programs within the Marine Corps.  
(U) Schedule: N/A  
(U) Technical: N/A

C. (U) Other Program Funding Summary  
(APPN, BLI #, NOMEN)

(U) CCR PMC BLI # 463000

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl CONT.	Total Cost CONT.
	0	104115	80656	45114	43626	41289	47726		

(U) Related RDT&E

(U) PE 0604817A

(U) PE 0206623M, Marine Corps Ground Combat/Supporting Arms Systems

D. (U) Schedule Profile  
Not Applicable.

R-1 Line Item 175

Budget Item Justification

(Exhibit R-2, Page 59 of 85)

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A. (U) Project Cost Breakdown	FY 1999	FY 2000	FY 2001
Software Development/Integration Testing	300	375	300
Civilian Salaries	426	435	446
Program Management Support	2117	1587	1513
System Engineering PM Support	3892	2485	1961
Development Support Equipment Acquisition	1065	1065	1644
Test/Certification	1646	1209	650
Total	9446	7156	6514

### B. Budget Acquisition History and Planning Information

## Performing Organizations

Contractor or Government Performing Activity	Contract Method/ Type or Funding Vehicle
<p>1. <u>Contract</u></p> <p>2. <u>Government</u></p>	<p>1. <u>Contract</u></p> <p>2. <u>Government</u></p>

## Product Development Organizations

**JWID:**

MCTSSA, Camp  
Pendleton, CA  
HQMC  
Arlington, VA

**CCR:**

TBD

TBD

**JINTACCS**

CECOM FT

CECOMPT  
MONMOUTH, NJ

## Support and Management Organizations

**JWID:**

Logicon, Stafford, VA C/FFP Oct99

Project Office	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
EAC						

## Product Development Organizations

**JWID:**

MCTSSA, Camp  
Pendleton, CA  
HQMC  
Arlington, VA

**CCR:**

TBD

TBD

**JINTACCS**

CECOM FT

CECOMPT  
MONMOUTH, NJ

## Support and Management Organizations

**JWID:**

Logicon, Stafford, VA C/FFP Oct99

R-1 Line Item 175

### Budget Item Justification

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EXHIBIT R-2 (FMM)

## Systems

COST (In Millions)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
C2278 Air Defense Weapons Systems	1855	9705	21730	27408	21754	6641	4057	Continuing	Continuing
Quantity of RDT&E Articles									

## A. (U) Mission Description and Budget Item Justification:

(1) This project encompasses two sub-element programs which are part of the Integrated Air Defense System for the Marine Corps.

1. The Expeditionary Air Defense System (EADS) is the Marine Corps' low altitude ground based air defense system. Upgrades include mobility enhancements and expeditionary air defense improvements. Primarily, the Continuous Wave Acquisition Radar (CWAR) is the only sensor organic to the Marine Corps capable of providing low altitude target acquisition in a high clutter environment.
2. Combat ID (CID) will provide rapid and accurate determination of friends, foes, or neutral identities of all potential targets within a combatant's area of responsibility in time to take decisive action. It will enable fighting forces: to manage and control battlespace; optimally employ weapons and forces to increase the economy of force; lower combat attrition, and increase enemy losses while reducing fratricide.
3. The Cooperative Engagement Capability (CEC) enables all CEC-equipped, Anti-Air Warfare (AAW) weapons systems in a battle force to operate as a single, distributed AAW weapon system. This is accomplished providing timely sharing of fire control quality sensor data, correlated identification data, and AAW weapon system management status via a Data Distribution System (DDS). The data is processed independently the Cooperative Engagement Processor (CEP) on-board each Cooperating Unit (CU) to construct a detailed tract and status database in real time to provide required remote data to and from the local AAW weapon system elements (hardware and software modified for CEC). In this manner, each CU of a battle force can operate cooperatively with the other CUs, taking advantage of diverse locations and aspect angles, various AAW system capabilities, and degrees of availability by sharing sensor data, and coordinating engagements, fire control illuminators, and AAW missiles.
4. The Complementary Low Altitude Weapons System (CLAWS) is a mobile ground based air defense missile system designed to defeat threat cruise missiles unmanned aerial vehicles, and aircraft. CLAWS takes advantage of government furnished equipment (GFE) and non-developmental items (NDI) and technology by integrating current inventory DoD missiles with existing High Mobility Multi-purpose Wheeled Vehicles (HMMWV). CLAWS shall provide a rapidly deployable, mobile, high firepower, all-weather, standoff air defense system to defend Marine Expeditionary Forces and Naval Forces from attack by cruise missiles, aircraft and UAVs. It shall complement existing short range air defense (SHORAD) capabilities and shall interface with current and proposed Marine Air Command and Control System sensors and data paths.

R-1 Line Item 175

Budget Item Justification

(Exhibit R-2, Page 62 of 85)

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# 1. PROGRAM DESCRIPTION (MAXIMUM OF 100 CHARACTERS)

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Systems

## PROGRAM ACCOMPLISHMENTS AND PLANS:

### (U) FY 1999 Accomplishments Program:

- (U) \$ 1,845 EADS: Completed Identification Friend or Foe (IFF) continuous wave acquisition radar integration.
- (U) \$ 10 EADS: Completed Program Support and supplies IAW the Technical Support Plan
- (U)Total \$ 1,855

### (U) FY 2000 Planned Program:

- (U) \$ 3,600 CEC: Initiate development of a land based CEC Engineering Design Model.
- (U) \$ 1,000 CEC: Initiate design and development of a land based CEC antenna.
- (U) \$ 158 CEC: Certify AN/TPS-59(V)3 adaptive layer software.
- (U) \$ 500 CEC: Initiate development of UPX-27(IFF) adaptive layer software.
- (U) \$ 500 CEC: Initiate design of combat system adaptive layer interface.
- (U) \$ 700 CEC: Conduct Developmental Testing.
- (U) \$ 200 CEC: Program support to provide program documentation.
- (U) \$ 400 CEC: Program Management Support.
- (U) \$ 400 CID: Test and evaluate systems currently available COTS for applicability.
- (U) \$ 1,347 CID: Program Definition and Risk Reduction of systems.
- (U) \$ 250 CID: Initiate Studies to investigate feasibility of using various fielded systems to fulfill some CID requirements.
- (U) \$ 500 CID: Program Support.
- (U) \$ 150 CID: Life Cycle Cost Estimate
- (U)Total \$ 9,705

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Budget Item Justification

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NAVY BUDGET REQUEST (R-2 FY 2001)

Systems

- (U) FY 2001 Planned Program:
- (U) \$ 700 CEC: Continue development of land based CEC EDM.
  - (U) \$ 2,200 CEC: Continue development of land based CEC antenna.
  - (U) \$ 200 CEC: Certify UPN-27(JFF) adaptive layer software.
  - (U) \$ 800 CEC: Investigate CWAR and ATC radar adaptive layer development.
  - (U) \$ 1,000 CEC: Continue combat system adaptive layer development.
  - (U) \$ 800 CEC: Continue to Conduct Development Testing.
  - (U) \$ 348 CEC: Continue Program support to provide program documentation.
  - (U) \$ 500 CEC: Continue Program Management Support.
  - (U) \$ 2,000 CID: Test and evaluate systems identified by the RFP
  - (U) \$ 3,288 CID: Program Definition and Risk Reduction of RFP systems.
  - (U) \$ 1,300 CID: Continue Studies to investigate feasibility of using various fielded systems to fulfill CID requirements (add'l mission areas).
  - (U) \$ 1,145 CID: Continue Program support.
  - (U) \$ 6,000 CLAWS: Develop, design and build a CLAWS prototype in preparation for a fly-off and down select.
  - (U) \$ 1,449 CLAWS: Program Management Support.
  - (U) Total \$ 21,730

B. (U) Project Change Summary

- (U) Previous President's Budget
- (U) Adjustments to Previous President's Budget
- (U) Current Budget Submit

	FY 1999	FY 2000	FY 2001
	2001	9759	9350
	-146	-54	12380
	1855	9705	21730

(U) Change Summary Explanation:

(U) Funding: FY99: Decrease in the amount of \$37K for SBIR tax assessment. FY99: Decrease in the amount of \$100K is due to reprioritization of programs within the Marine Corps. FY99: Decrease in the amount of \$9K due to NavCompt adjustments. FY00: Decrease in the amount of \$54K due to General Reductions. FY01: Increase in the amount of \$12.5M is due to reprioritization of programs within the Marine Corps. FY01: Decrease of \$198K due to NavCompt adjustments. FY01: Decrease of \$149K due to PBD 604 and increase of \$197K due to PBD 411. FY01: Increase of \$30K due to NWCF rate adjustments.

(U) Schedule: N/A

(U) Technical: N/A

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Budget Item Justification

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# RDT&F BUDGET ITEM JUSTIFICATION SHEET (P-2 Exhibit)

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Systems

## C. (U) Other Program Funding Summary

- (U) PMC LINE BLI 300600 EADS MOD
- (U) PMC LINE BLI 462000 EADS (CWAR)
- (U) PMC LINE BLI 464000 CTR
- (U) PMC LINE BLI 464000 CEC
- (U) PMC LINE BLI 300600 CLAWS

## (U) Related RDT&F

FE 06032160 Ballistic Missile Defense Organization, Theater Missile Defense

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
	976	0	0	0	0	0	0	0	976
	0	1500	1507	1552	1593	0	0	0	6152
	0	0	0	0	0	15805	22838	CONT.	CONT.
	0	0	0	10057	17320	21564	28295	CONT.	CONT.
	0	0	0	0	0	19739	31544	CONT.	CONT.

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Budget Item Justification

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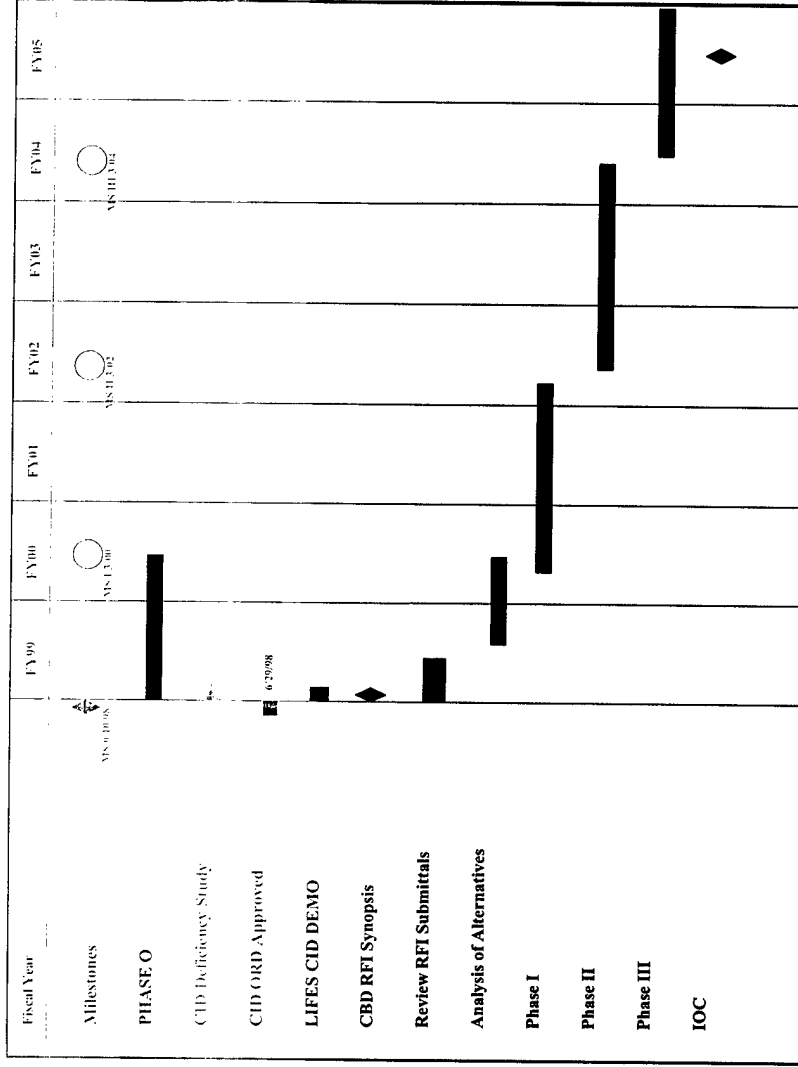
# RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE February 2000

Systems

## D. (U) Schedule Profile

CID Schedule:



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Budget Item Justification

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# RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

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CEC Schedule:

## Cooperative Engagement Capability

ID	Task Name	1997				1998				1999				2000				2001				2002				2003				2004				2005			
1	CEC MWS (DRAFT)	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
2	CEC CRD (DRAFT)																																				
3	MS 0																																				
4	CONCEPT EXPLORATION																																				
5	MSI																																				
6	PDRR																																				
7	MSII																																				
8	EMD																																				
9	MSIII																																				
10	IOC (EST)																																				
11	FOC (EST)																																				

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Budget Item Justification

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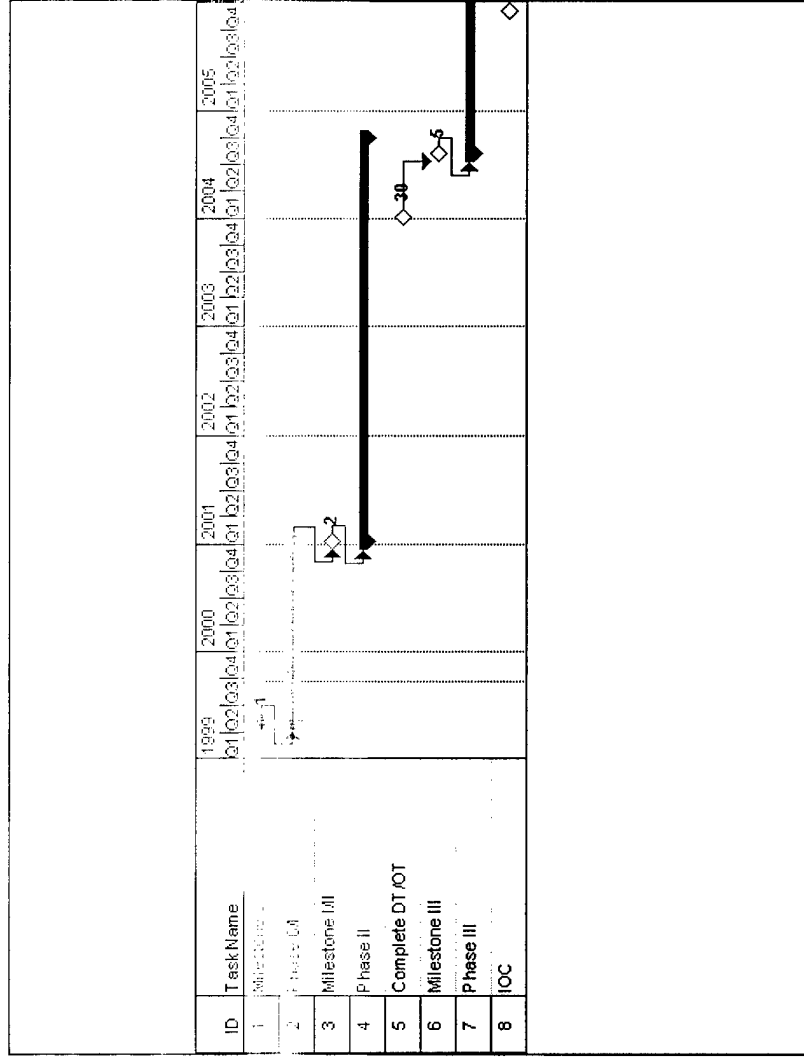
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# PROCESS PROJECT ITEM JUSTIFICATION SHEET (R-2 Exhibit)

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SYSTEMS

CLAWS Schedule:



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Budget Item Justification

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# PROJECT COST BREAKDOWN (R-3)

A. (U) Project Cost Breakdown	FY 1999	FY 2000	FY 2001
a. Development of Engineering Design Model	0	3600	700
b. System Design and Development	0	1500	10000
c. Software Certification	0	158	200
d. Software Development	0	500	0
e. Developmental Testing	0	700	800
f. Program Support	10	1100	3442
g. Test and Evaluation	0	400	2000
h. Program Definition and Risk Reduction	0	1347	3288
i. Studies	0	250	1300
j. System Integration	1845	0	0
k. Life Cycle Cost Estimate	0	150	0
Total	1855	9705	21730

## B. Budget Acquisition History and Planning Information

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
<b>Product Development Organizations</b>										
<b>EADS:</b>										
MICOM, Redstone Arsenal, AL	MIPR	FEB 99	2400	2400	545	1845	0	0	0	2400
MCTSSA, Camp Pendleton, CA	WR	DEC 98	29	29	19	10	0	0	0	29
<b>CID:</b>										
USACOM Norfolk, VA	MIPR	JAN 00			0	0	1347	0	CONT.	CONT.

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Budget Item Justification

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FEDERAL AID TO CIVIL CONTROL COST ESTIMATION (FACCE)						DATE
	RCP	JAN 00	0	0	CONT.	CONT.
Quantico, VA	TBD	TBD	0	0	1300	CONT.
<b>CEC:</b>						
JHU/APL	MIPR	DEC 99	0	0	3288	CONT.
NAVSEA	MIPR	DEC 99	0	0	850	CONT.
Crystal City, VA			0	0	2200	CONT.
MCSC	RCP	DEC 99	0	0	200	CONT.
Quantico, VA						
MCSC	RCP	DEC 99	0	0	300	CONT.
Quantico, VA						
MCTSSA, Camp	WR	DEC 99	0	0	300	CONT.
Pendleton, CA						
NSWC	WR	DEC 99	0	0	950	CONT.
Crane, IN						
NSWC	WR	DEC 99	0	0	100	CONT.
Dahlgren, VA						
<b>CLAWS:</b>						
TBD	TBD	TBD	0	0	6000	CONT.
<b>Support and Management Organizations</b>						
<b>CID:</b>						
MCSC	RCP	JAN 00	0	0	970	CONT.
Quantico, VA						
MCSC	WR	DEC 99	0	0	175	CONT.
Quantico, VA						
<b>CEC:</b>						
NAVSEA	MIPR	DEC 99	0	0	500	CONT.
Crystal City, VA						
MCSC	RCP	DEC 99	0	0	348	CONT.
Quantico, VA						
<b>CLAWS:</b>						
TBD	TBD	TBD	0	0	1449	CONT.
<b>Test and Evaluation Organizations</b>						

Budget Item Justification

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**R-1 Line Item 175**

### Budget Item Justification

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### Budget Item Justification

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## BUDGET ITEM JUSTIFICATION SHEET (B-2 FORM)

DATE

February 2000

Funds in \$

CONST (In Millions)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
C2315 Training Devices/Simulators	8213	12088	5871	9529	12221	5042	486	Continuing	Continuing
Quantity of RDT&E Articles									

A. (U) Mission Description and Budget Item Justification:

(U) Training simulators supported by this program of interest include Joint Simulation System (JSIMS), Range Instrumentation Systems (RIS), and Combat Vehicle Appended Trainer (CVAT). These training systems provide tactical weapons and decision-making skill training from entry level through Marine Air-Ground Task Force (MAGTF) staff level. Together these systems will be interoperable and will allow for mission planning, mission rehearsal and concept evaluation in a valid synthetic environment with objective, timely feedback. Through live, virtual and constructive simulation, the Marine Corps will have the means to train jointly, educate, develop doctrine and tactics; formulate and assess operational plans, assess warfighting situations and define operational requirements.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:(U) FY 1999 Accomplishments:

- (U) \$ 298 JSIMS: Provided Marine Corps funding to Communication and Electronics Command (CECOM) for the development of the USMC specific Test and Evaluation master plan and provide technical expertise to the JSIMS test planning group for the Build 1 demonstration.
- (U) \$ 5316 JSIMS: Continued to provide technical expertise to the US Army, US Navy and US Air Force in the development of USMC specific requirements. Completed development of USMC requirements for software build 1. Procured Test hardware for Camp Lejeune in preparation for Collaborative Event.
- (U) \$ 400 JSIMS: Provided USMC Funding to Naval Air Warfare Center to continued development of JSIMS Build 2 and Build 3 conceptual models for USMC.
- (U) \$ 1000 JSIMS: Provided USMC Funding to US Army Simulation Training and Instrumentation Command (STRICOM) to begin development of USMC Tactical Intelligence Systems.
- (U) \$ 528 JSIMS: Supported development of USMC notional hardware configurations and participated in the Enterprise development of USMC C4I interface requirements.
- (U) \$ 624 MTWS: Performed analysis, design, implementation and tested of MAGTF Tactical Warfare Simulation product improvement development.
- (U) \$ 47 Amount set aside for inflation savings
- (U) Total \$ 8,213

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Budget Item Justification

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USMC C4I Interface Requirements

- (U) \$ 250 JSIMS: Continue technical expertise to test planning group for build 1 demonstration. Participate in Collaborative Event and provide Verification, Validation, and Accreditation of USMC requirements.
- (U) \$ 528 JSIMS: Continue support in the development of USMC notional hardware configurations and participates in the Enterprise development of USMC C4I interface requirements.
- (U) \$ 6407 CVAT: Develop appended trainer M1A1 and LAV prototype.
- (U) \$ 450 CVAT: Develop/Modify visual database.
- (U) \$ 550 CVAT: Perform independent verification and validation/testing of prototype functionality and interfaces.
- (U) Total \$ 12088

(U) FY 2001 Planned Program:

- (U) \$ 3955 JSIMS: Continue to provide technical expertise to the US Army, US Navy and US Air Force in the development of USMC specific requirements. Participate in Collaborative Event 2 (software for build 2) and the Initial Operational Capability (IOC) event. Complete build 3 software development.
- (U) \$ 340 JSIMS: Continue Verification, Validation, and Accreditation and participate in Collaborative Event 2 and IOC event.
- (U) \$ 528 JSIMS: Continue support in the development of USMC notional hardware configurations and participate in the Enterprise development of USMC C4I interface requirements.
- (U) \$ 123 CVAT: Complete developmental testing
- (U) \$ 925 CVAT: Complete software modification enhancements to prototypes incorporating results of developmental test.
- (U) Total \$ 5871

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Budget Item Justification

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**B. (U) Project Change Summary**

	FY 1999	FY 2000	FY 2001
(U) Previous President's Budget	9368	8850	4881
(U) Adjustments to Previous President's Budget	(1155)	3238	990
(U) Current Budget Submit	8213	12088	5871

**(U) Change Summary Explanation:**

(U) Funding: FY99 decrease in the amount of (\$1155) for miscellaneous adjustments. FY00 and FY01 adjustments are the result of reprioritization of programs within the Marine Corps.

(U) Schedule: A revised acquisition strategy will require increased developmental testing for the CVAT program extending the schedule into FY01. The increase developmental testing is required to develop new software instead of reusing existing software.

(U) Technical:

**C. (U) Other Program Funding Summary**  
(APPN, BLI #, NOME)

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
(U) PC BLI# 653200 Training Devices/Simulators	3297	13750	30791	21577	17567	24741	24959	0	CONT.
(U) PC BLI# 463000 Common Computer Resources	0	0	935	434	434	398	0	0	2201

(U) Related RDT&E

PE 0603832D, Joint Simulation Management

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Budget Item Justification

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DATE: February 2000

BY: [illegible]

ISVS

D. (U) Schedule Profile

ISVS

Fiscal Year	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	Total
Contract Award	2 Dec 96									
Version 1.0										
Build 1										
Build 1 SERT Demo										
Build 2										
Build CE										
Build 3										
Build 3 CE										
Version 1.0 VRM										
IOC Event/OT&E										
MS III										
Version 1.1/VRM										
Version 1.2/VRM										
Version 2.0/VRM										

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Budget Item Justification

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## A. (U) Project Cost Breakdown

	FY 1999	FY 2000	FY 2001
Subtotal Product Development	7746	11143	5289
Subtotal Support and Management	169	745	242
Subtotal Test and Evaluation	298	200	340
Total	8213	12088	5871

## Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
--	---	--------------------------	-------------------------	--------------------	------------------------	---------	---------	---------	--------------------	---------------

## Product Development Organizations

VISICOM, Labs Inc. San Diego, CA	RCP	NOV 97			3447	3479	3315	3317	CONT	CONT
STRICOM Orlando, FL	RCP	NOV 98	1000	1000	0	1000	0	0	0	1000
TBD, MARCOR SYSCOM	RCP	DEC 99			0	0	5781	925	0	6706
NRaD, San Diego, CA	WR	DEC 97			1196	600	400	400	CONT	CONT
CECOM, Ft. Monmouth, NJ	MIPR	NOV 97			1375	528	528	528	CONT	CONT
Naval Air Warfare Center, Orlando, FL	RCP	DEC 97	680	680	279	401	0	0	0	1029
Naval Air Warfare Center Orlando FL	RCP	NOV 97	760	760	380	380	0	0	0	760
MCIA	WR	NOV 97			238	119	119	119	CONT	CONT

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Quantico, VA										
C R	RCP	NOV 99	2500	0	1239	1000	0	0	2500	
Quantico, VA										
Support and Management Organizations										
Naval Air Warfare Center, Orlando, FL	WR	NOV 97	100	50	50	0	0	0	100	
FL										
Naval Surface Warfare Center	RCP	NOV 97	238	119	119	119	119	119	CONT	
Indian Head, MD									CONT	
SVERDRUP	RCP	MAR 00	0	0	0	353	0	0	353	
Ft Walton Beach										
FL										
Test and Evaluation Organizations										
MCOTEA	RCP	NOV 98	0	298	200	340	340	340	CONT	
Quantico, VA										
Government Furnished Property										
Contract										
Item	Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program	
Product Development Property										
Support and Management Property										
Test and Evaluation Property										
Subtotal Product Development										
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project										
				Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program	
				6915	7746	11143	5289	CONT	CONT	
				288	169	745	242	CONT	CONT	
				0	298	200	340	CONT	CONT	
				7203	8213	12088	5871	CONT	CONT	
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## BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

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	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	TELECOM
G2510 MAGTF CSSE S&E	0	1,105	10,74	681	535	257	Continuing	Continuing
Quantity of RDT&E Articles								

A. (U) Mission Description and Budget Item Justification:

(U) The MAGTF Combat Service Support Element & Supporting Establishment (CSSE & SE) consists of mutually supporting Logistics Information Technology (IT) programs that support force deployment, planning, and execution; sustainment and distribution; and contribute to the CINCPAC's Common Operating Picture (COP) to support rapid accurate decision making.

1. The ATLASS capability represents a deployable capability that will be used in the tactical deployed areas of the Marine Corps, as well as in garrison. The ATLASS PIP program funds the improvement of the fielded ATLASS II+ system as well as the migration of base and station (non-deployable) USMC intermediate and consumer level supply and maintenance systems from a mainframe environment into a personal computer application using a networked client server architecture. The ATLASS PIP consolidated the total force intermediate and consumer level supply and maintenance information management functions into a single material management system. ATLASS PIP enhances ATLASS II+, retires existing mainframe legacy applications in use by the bases and stations, and expands the client-server based supply maintenance and material readiness Automated Information System (AIS) ATLASS II+ to them. ATLASS PIP retains the flexibility to exploit existing commercial and government off-the-shelf software. This system remains compliant with the MAGTF C4I concept, GCCS COE, and published DOD standards for open systems architecture.

2. TC-AIMS II is a Joint transportation and deployment Automated Information System (AIS) supporting the DOD mission areas of mobility and sustainment. It will replace two of our MAGTF LOG AIS applications over a parallel transition starting in FY00. TC-AIMS II will be used by Command Elements, Traffic Management Offices (TMO), and all operating forces deploying units to automate the processes of planning, organizing, coordinating, and controlling deployment, redeployment, and sustainment activities worldwide, in peace as well as during contingencies. It provides a modernized, scalable, integrated, and easily deployable AIS that supports reengineered deployment and business processes throughout DOD. TC-AIMS II is the key enabler towards Force Deployment Planning and Execution. It is the source system for In-Transit-Visibility (ITV) data, which provides CINCPACs and Components with critical visibility of items in the transportation pipeline. TC-AIMS II links all DOD Component unit movement and Installation Transportation Office/Traffic Management Office (ITO/TMO) functionality into a single transportation management system. It is a Joint ACAT 1A(M) program, with the USMC portion being handled as an ACAT III.

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PROJECT (A-2 F-117)

15000000

TC-AIMS II: Evaluation of web-based version of TC-AIMS II as an

(U) FY 1999 Accomplishments: Not Applicable.

(U) FY 2000 Planned Program:

- (U) \$ 250 ATLASS PIP: Commence design and development activity of ATLASS PIPs.
- (U) \$ 200 ATLASS PIP: Evaluate and Integrate existing software and hardware modules and technology.
- (U) \$ 50 ATLASS PIP: Commence development of implementation and support plans.
- (U) \$ 49 TC-AIMS II: Exploration and development of Integration Plans with Air/Ship/Rail Load Planning and Joint Planning & Execution Tools, leveraging data warehousing and operational data stores initiatives.
- (U) \$ 44 TC-AIMS II: Evaluate web-enabling technologies and messaging backbone utilities for developing a web based version of TC-AIMS II as an improvement in the concept of operations over the client server configuration.

(U)Total \$ 1,135

(U) FY 2001 Planned Program:

- (U) \$ 250 ATLASS PIP: Continue evaluating design and development activity of ATLASS PIP's.
- (U) \$ 138 ATLASS PIP: Test and evaluate existing ATLASS II+ software.
- (U) \$ 100 ATLASS PIP: Continue and Complete implementation and support plans.
- (U) \$ 241 TC-AIMS II: Continue design & development of web-enabling technologies, messaging backbone, and integration with air/ship/rail load and joint planning & execution tools.
- (U) \$ 345 TC-AIMS II: Exploration and development of Automatic Identification Technology (AIT) and Radio Frequency Identification (RF ID) enablers, supporting data warehousing and operational data store initiatives.

(U)Total \$ 1,074

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(U) Previous President's Budget  
 (U) Adjustments to Previous President's Budget  
 (U) Current Budget Submit

(U) Change Summary Explanation:  
 (U) Funding: FY00 and FY01 (BLI#464100) ATLAS PIP  
 (U) Schedule: N/A  
 (U) Technical: N/A

C. (U) Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To	Total
(U) PNC Line (BLI#464100) ATLAS PIP	0	0	0	2529	1161	385	478	CONT	CONT
(U) PNC Line (BLI#464100) TC-AINIS II	0	4486	10072	0	0	0	0	CONT	CONT

(U) Related RDT&E  
 None

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Budget Item Justification

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### ATLASS PIP SCHEDULE

	EV00	1stQTR	2ndQTR	3rdQTR	4thQTR	EV00	1stQTR	2ndQTR	4thQTR	EV05
DESIGN										
SME #1										
PDR										
SME #2										
GDR										
DEVELOP										
PMR										
SME										
TEST										
Pilot Site Prep										
Pilot Site										
OT										
IMPLEMENT										
IOC										
FOC										
MILESTONE										
MS II										

LEGEND:  
OT Operational Test  
IOC Initial Operational Capability  
FOC Full Operational Capability  
MS Milestone Decision

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Budget Item Justification

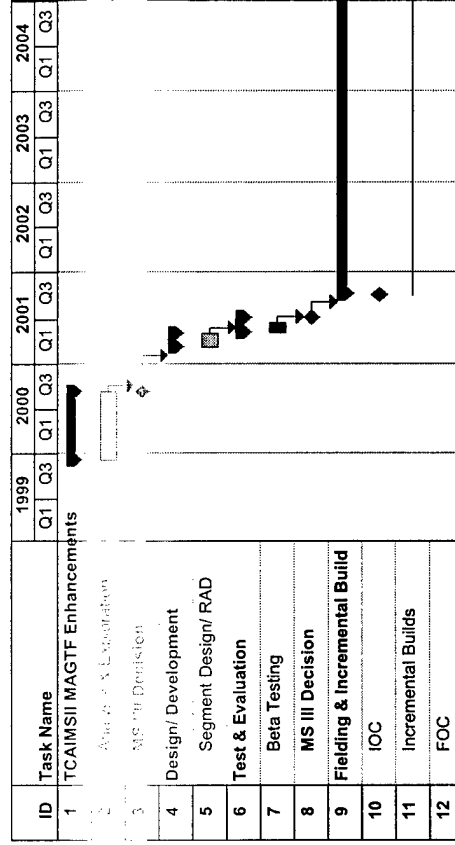
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TC-AIMS II Schedule

## TC-AIMS II MAGTF R&D Enhancements



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Budget Item Justification

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DATE: 11/10/00

PROJECT TITLE: 110M Marine Corps Communications Systems 02310

**A. (U) Project Cost Breakdown**

	FY 1999	FY 2000	FY 2001	
Product Development	0	773	645	
Support and Management	0	101	237	
Test and Evaluation	0	261	192	
Total	0	1135	1074	

**B. Budget Acquisition History and Planning Information****Performing Organizations**

Contractor or Government Performing Activity	Contract Method/Type of Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
--	---	--------------------------	-------------------------	--------------------	------------------------	---------	---------	---------	--------------------	---------------

**Product Development Organizations**

ATLASS PIP:										
SSC Chesapeake	MIPR	Feb 00	1580	1580	0	0	0	680	250	650
TC-AIMS II:										
US Army (PEOSTAMIS) (GTE, BBN)	FFP/O	Feb 00			0	0	0	93	395	CONT

**Support and Management Organizations**

ATLASS PIP:										
Logicon	Spt/Svcs	Nov 99	297	297	0	0	0	101	196	0
TC-AIMS II:										
US Army, PEOSTAMIS (GTE, BBN)	FFP/O	Feb 00			0	0	0	0	41	CONT

**Test and Evaluation Organizations**

ATLASS PIP:										
SSC Charleston	MIPR	Feb 00	303	303	0	0	0	261	42	0
TC-AIMS II:										
										303

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Budget Item Justification

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## UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)				DATE	February 2000																																										
BUDGET ACTIVITY	PE NUMBER AND TITLE			PROJECT																																											
<b>7 - Operational System Development</b>	<b>0206313M Marine Corps Communications Systems</b>			<b>C2510</b>																																											
MarCorSysCom, FFP/O	Nov 99	0	0	0	150																																										
Quantico, VA					CONT																																										
(Logicon, MITRE)					CONT																																										
Subtotal Product Development					CONT																																										
Subtotal Support and Management					CONT																																										
Subtotal Test and Evaluation					CONT																																										
Total Project					CONT																																										
<table> <tr> <td colspan="2">Total</td><td></td><td></td><td></td><td></td></tr> <tr> <td>Prior to</td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>FY 1999</td><td>FY 1999</td><td>FY 2000</td><td>FY 2001</td><td>Budget to Complete</td><td>Total Program</td></tr> <tr> <td></td><td>0</td><td>773</td><td>645</td><td>CONT</td><td>CONT</td></tr> <tr> <td></td><td>0</td><td>101</td><td>237</td><td>CONT</td><td>CONT</td></tr> <tr> <td></td><td>0</td><td>261</td><td>192</td><td>CONT</td><td>CONT</td></tr> <tr> <td></td><td>0</td><td>1135</td><td>1074</td><td>CONT</td><td>CONT</td></tr> </table>						Total						Prior to						FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program		0	773	645	CONT	CONT		0	101	237	CONT	CONT		0	261	192	CONT	CONT		0	1135	1074	CONT	CONT
Total																																															
Prior to																																															
FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program																																										
	0	773	645	CONT	CONT																																										
	0	101	237	CONT	CONT																																										
	0	261	192	CONT	CONT																																										
	0	1135	1074	CONT	CONT																																										

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Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)							DATE	February 2000		
BUDGET ACTIVITY		PE NUMBER AND TITLE								
7 - Operational System Development		0206623M Marine Corps Ground Combat/Supporting Arms Systems								
	COST (In Millions)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
	Total Program Element (PE) Cost	16235	28679	22124	19088	10484	9583	9854	Continuing	Continuing
C0021	Assault Amphibious Vehicle 7A1 (AAV7A1)	512	396	406	357	368	378	390	Continuing	Continuing
C1555	Light Armored Vehicle (LAV) PIP	1829	8328	9849	6219	1328	1358	1394	Continuing	Continuing
C1901	Marine Corps Ground Weaponry PIP	5821	13244	8073	7878	4444	3091	3238	Continuing	Continuing
C2086	Marine Enhancement Program	3575	1475	1656	2604	2498	2813	2862	Continuing	Continuing
C2237	Amphibious Vehicle Test Branch	625	639	724	729	742	816	820	Continuing	Continuing
C2317	ASCIET	1	0	0	0	0	0	0	0	1155
C2503	Initial Issue	0	1613	1416	1301	1104	1127	1150	Continuing	Continuing
C2666	Automatic Target Tracker	1936	0	0	0	0	0	0	0	1936
C2667	Shortstop Electronic Protection System	1936	2984	0	0	0	0	0	0	4920
	Quantity of RDT&E Articles									
<p>(U) <b>Mission Description and Budget Item Justification:</b> This PE provides modification to Marine Corps Expeditionary Ground Force Weapon Systems to increase lethality, range, survivability and operational effectiveness. It also provides for the development of AAV7A1 reliability, maintainability, operational and safety modifications, improvements in command and control in the ADMS, product improvements to the family of LAVs and the development effort for the LAV-AD variant. The AVTB provides facilities and personnel which perform a broad range of testing, repair and technical services to amphibious vehicles.</p> <p>(U) <b>Justification for Budget Activity:</b> This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing and manufacturing development for upgrades of existing systems.</p>										
R-1 Line Item 176							Budget Item Justification			

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE								PROJECT	
7 - Operational System Development		0206623M Marine Corps Ground Combat/Supporting Arms Systems								C0021	
	COST (In Millions)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost	
C0021 Assault Amphibious Vehicle 7A1 (AAV7A1)		512	396	406	357	368	378	390	Continuing	Continuing	
Quantity of RDT&E Articles											
<p><b>A. (U) Mission Description and Budget Item Justification:</b></p> <p>(U) The AAV7A1 RDT&amp;E program provides for the development, test and preparation of Engineering Change Proposals (ECPs) to improve the performance, reliability, maintainability and safety of the AAV7A1 Family of Vehicles (FOV). This program also allows for the development of installation kits for the integration of communications and navigation equipment developed for integration into the AAV7A1 FOV.</p> <p><b>(U) FY 1999 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 212 Continued providing engineering support for integration of modification kits into AAV7A1 Family of Vehicles.</li> <li>• (U) \$ 300 AAV communications Upgrade improvements to AAV7A1 Family of vehicles</li> <li>(U) Total \$ 512</li> </ul> <p><b>(U) FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 396 Continue providing engineering support for integration of modification kits into AAV7A1 Family of Vehicles.</li> <li>(U) Total \$ 396</li> </ul> <p><b>(U) FY 2001 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 406 Continue providing engineering support for development and integration of modification kits into AAV7A1 Family of Vehicles.</li> <li>(U) Total \$ 406</li> </ul>											
R-1 Line Item 176										Budget Item Justification	

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## RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

February 2000

PE NUMBER AND TITLE

**0206623M Marine Corps Ground  
Combat/Supporting Arms Systems**

**C00021**

	FY 1999	FY 2000	FY 2001
...	...	...	...

1122	11200	112001
216	398	409

296 -2 -3

396 406

Change Summary Explanation:  
(U) Funding: FY 1999 increase is due to the reprioritization of programs within the Marine Corps. FY 2000 and FY 2001 adjustments are due to minor affordability adjustments.

(U) Funding: FY 1999 increase is due to the reprioritization of programs within the Marine Corps. FY 2000 and FY 2001 adjustments are due to minor affordability adjustments.

(U) Schedule: N/A

(U) Technical: N/A

### C. (U) Other Program Funding Summary

(c) Source & Collection  
(APPN, BLI #, NOMEN)

(U) PMC, 202100, AAV PIP

FY 1999

FY 2000

FY 2001

FY 2002

FY 2003

FY 2004

FY 2005

To

Total

(U) Related RDT&E: PE 0603611M (Marine Corps Assault Vehicles)

**D. (U) Schedule Profile:** N/A

### Budget Item Justification

**UNCLASSIFIED**

## UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE		PROJECT							
7 - Operational System Development		0206623M Marine Corps Ground Combat/Supporting Arms Systems		C1555							
	COST (In Millions)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost	
C1555 Light Armored Vehicle (LAV) PIP		1829	8328	9849	6219	1328	1358	1394	Continuing	Continuing	
Quantity of RDT&E Articles											
<p><b>A. (U) Mission Description and Budget Item Justification:</b>  The Light Armored Vehicle Family of Vehicles (LAV FOV) consists of seven fielded LAV configurations, and one communications/intelligence-configured asset on an LAV chassis (Mobile Electronic Warfare Smbjhgupport System). Collectively, the LAV FOV provides a logistically self-contained, highly mobile, and lethal combined arms combat system to the Marine Air-Ground Task Force (MAGTF). This project funds for the development and testing of modifications falling within the purview of the LAV Service Life Extension Program (SLEP) (See PMC: LAV SLEP (FY 2002-FY 2005)) and the LAV Command and Control (See LAV C2 (FY2003) Product Improvement Programs. These programs will provide the following: (1) LAV SLEP will ensure the LAV FOV will be capable of conducting its assigned missions through FY 2015 by enhancing lethality and survivability; reliability, availability, maintainability and durability; as well as reducing operations and support costs. The LAV SLEP will essentially invest in technologies currently existing on newer generations of Light Armored Vehicles and other weapons systems. (2) The LAV C2 modification will enhance overall Light Armored Reconnaissance (LAR) Battalion and MAGTF command and control capabilities by investing in C4I systems that will enhance communications, interoperability, and connectivity with the LAR Battalions and within other USMC C4I systems.</p>											
<p><b>(U) FY 1999 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 460 Completed development, testing and evaluation of urgent LAV RAM-D and readiness enhancements.</li> <li>• (U) \$ 1369 Continued study, development, and analysis of existing and other technological solutions; commence developmental and operational test planning for the LAV Service Life Extension Program.</li> </ul> <p>(U) Total \$ 1829</p>											
<p><b>(U) FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 4500 Development of 5 LAV SLEP operational system prototypes for developmental &amp; operational test and evaluation of SLEP modifications.</li> <li>• (U) \$ 1828 Continue study, analysis, and development of existing and other alternative technological solutions for the LAV Service Life Extension Program.</li> <li>• (U) \$ 508 Continue and complete developmental and operational test planning for the LAV Service Life Extension Program Test Planning</li> </ul>											
R-1 Line Item 176										Budget Item Justification	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT	
7 - Operational System Development	0206623M Marine Corps Ground Combat/Supporting Arms Systems	C1555	
<ul style="list-style-type: none"> <li>(U) \$ 1492 Conduct research and development of LAV C2 architectural and systems interoperability requirements.</li> <li>(U)Total \$ 8328</li> </ul>			
<b>(U) FY 2001 Planned Program:</b>			
• (U) \$ 430 Complete development of LAV SLEP operational system prototypes for test and evaluation of SLEP modifications.			
• (U) \$ 4252 Commence developmental and operational testing and evaluation of 5 LAV SLEP modification prototypes.			
• (U) \$ 2200 Continue development of LAV Service Life Extension Program to include fielding requirements, training, ILS, future maintenance requirements, and impacts to depot-level maintenance program.			
• (U) \$ 2567 Develop LAV C2 Modification prototype system for developmental and operational test and evaluation.			
• (U) \$ 400 Continue development of LAV C2 developmental and operational test requirements and plan.			
(U)Total \$ 9849			
<b>B. (U) Project Change Summary</b>			
(U) Previous President's Budget	FY 1999	FY 2000	FY 2001
(U) Adjustments to Previous President's Budget	1548	11706	12556
(U) Current Budget Submit	281	-3378	-2707
	1829	8328	9849
<b>(U) Change Summary Explanation:</b>			
(U) Funding: FY 1999 change due to a decrease of \$12K for SBIR tax assessment as well as a decrease of \$7K for a minor affordability adjustment. Additionally, \$300K was added due to reprioritization of programs within the Marine Corps. FY 2000 decrease in the amount of \$3,378M due to a reprioritization of programs within the Marine Corps as well as a minor affordability adjustment. FY 2001 decrease reflects PBD604 reduction as well as a realignment of LAV Enhanced Fire Support Platform (EFSP) resources.			
(U) Schedule: Schedule changes reflect current program estimates based on completion of Trade Studies and resultant definitization of program scope.			
(U) Technical:			
R-1 Line Item 176		Budget Item Justification	

## UNCLASSIFIED

## RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE \_\_\_\_\_

February 2000

## BUDGET ACTIVITY

## BUDGET ACTIVITY

PE NUMBER AND TITLE

**0206623M Marine Corps Ground  
Combat/Supporting Arms Systems**

**PROJECT  
C1555**

### C. (U) Other Program Funding Summary

**(APPN, BLI #, NOMEN)**

(U) PMC, 203800, LAV PIP

FY 1999

1380

FY 2000

1694

FY 2001

1709

FY 2002

47314

FY 2003

71235

FY 2004

44053

FY 2005

41652

Tot. Cost

CONT

(U) Related RDT&E: Not applicable

#### D. (U) Schedule Profile: LAV SLEP

**Milestone 0:** 1<sup>st</sup> Otr. FY 1998

**Milestone I:** 2<sup>nd</sup> Qtr. FY 1999

**Milestone I:** 2<sup>nd</sup> Qtr, FY 1999

**Milestone II:** 2<sup>nd</sup> Qtr, FY 2000

DT/OT: 2<sup>nd</sup> Qtr. FY 2001

**Milestone III:** 2<sup>nd</sup> Otr. FY 2002

Contract Award: 2<sup>nd</sup> Qtr. FY 2002

IOC: 1st Qtr FY 2005

FOC: 1st Qtr FY 2009

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### Budget Item Justification

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## RDT&amp;E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

February 2000

BUDGET ACTIVITY

PE NUMBER AND TITLE

## 7 - Operational System Development

**0206623M Marine Corps Ground  
Combat/Supporting Arms Systems**

PROJECT  
C1555

### A. (U) Project Cost Breakdown

Product Development	1060	6371	3177
Support Costs and Management	555	1167	996
Test and Evaluation	214	790	5676
Total	1829	8328	9849

## B. Budget Acquisition History and Planning Information

## Performing Organizations

Contractor or Government Performing Activity	Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity <u>EAC</u>	Project Office <u>EAC</u>	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
<b>Product Development Organizations</b>										
Dies Div, GM	C/FF	Dec 97	915	915	615	0	0	0	0	915
In-house Product Development	WR	1 <sup>st</sup> Qtr			512	448	1252	624	Continue	Continue
Booz Allen	C/FF	2 <sup>nd</sup> Qtr 99			200	300	0	0	0	0
Other	Various	Various			9680	312	5119	2553	Continue	Continue
<b>Support and Management Organizations</b>										
In-house Support	WR	1 <sup>st</sup> Qtr			23246	555	1167	996	Continue	Continue
<b>Test and Evaluation Organizations</b>										
Other (LAV Test Dir/YumaPrvGrd)	WR	Various			4442	214	790	5676	Continue	Continue

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### Budget Item Justification

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## RDT&amp;E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

February 2000

PE NUMBER AND TITLE

**0206623M Marine Corps Ground  
Combat/Supporting Arms Systems**

**C1555**

### Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 2000	
BUDGET ACTIVITY		PE NUMBER AND TITLE								PROJECT	
7 - Operational System Development		0206623M Marine Corps Ground Combat/Supporting Arms Systems								C1901	
		COST (In Millions)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
C1901	Marine Corps Ground Weaponry PIP		5821	13244	8073	7878	4444	3091	3238	Continuing	Continuing
	Quantity of RDT&E Articles										
<p><b>A. (U) <u>Mission Description and Budget Item Justification:</u></b></p> <p>(U) This Project develops joint and Marine Corps unique improvements to infantry weapons and artillery technology, USMC unique Amphibious Armor Systems (AAS), improvements for the M1A1 Main Battle Tank and support systems, USMC Family of Small Craft, Night Vision Equipment and monitors national and international weapons developments.</p> <p><b>(U) FY 1999 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 74 Armored Vehicle Driver's Viewer Enhancer (AVDVE): Completed integrated logistics documentation and testing for the Light Armored Vehicle/ Amphibious Assault Vehicle procurement of the Armored Vehicle Driver's Viewer Enhancer for all USMC vehicles.</li> <li>• (U) \$ 413 M1A1 Armor Mods: Continued joint evaluation of modifications of amphibious armor including Component Enhancements, Advanced Fire Control Systems, survivability systems, M88 and Amored Vehicle Launch Bridge (AVLB) upgrades, combat identification and others.</li> <li>• (U) \$ 2992 Target Location Designator Hand-off System (TLDHS): Continued participation in the joint-Service, U.S. Army-led EMD development of the Lightweight Laser Designator Rangefinder (LLDR) hardware and software, and continue to develop TLDHS-specific software application. Began continued integration of LLDR with the Digital Automated Communication Terminal ( DACT) C2PC, and the Marine Air-Ground Task Force (MAGTF) C4I architecture.</li> <li>• (U) \$ 585 Fire Support Mods: Continued joint participation in artillery and fire support improvement projects. Specifically, continued joint sustainment of the M198 Howitzer and associated end items, to include development of updated Global Positioning System (GPS) Capability and user evaluations of the Elimination of Radioactive Light Sources (ERLS) collimator. Continued joint software modeling &amp; design and field user evaluations of the Firefinder Radar Position Analysis System. Conducted technical, operational and cost analysis of Family of Artillery Munitions. Provided support to the Marine Corps Warfighting Lab for the development, evaluation and rapid transition of fire support initiatives.</li> <li>• (U) \$ 110 Mortar Ballistic Computer (MBC): Continued unilateral development of USMC-unique ballistics software for the Mortar Ballistic Computer.</li> </ul>											

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Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)			DATE	February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE		PROJECT	
	0206623M Marine Corps Ground Combat/Supporting Arms Systems		C1901	
7 - Operational System Development				
• (U) \$	686	Infantry Wpns Mods: Continued joint participation and Marine Corps unique activities for evaluation of safety, lethality, and technology improvements for Marine Corps infantry/reconnaissance individual and crew served weapons. Pursued solutions to integrate weapons systems with existing and planned night vision and sighting technologies including revisions of mounts and interfaces. Began weapon system ingetration into the Integrated Infantry Combat System (IICS) to enhance the efficiency, effectiveness and safety of the Combat System.		
• (U) \$	560	Thermal Weapons Sight (TWS)[AN/PAS-13]: Joint participation and Marine Corps unique activities for the testing and evaluation of TWS.		
• (U) \$	401	Family of Small Craft: Provided Fault Analysis and Fault Isolation (FAFI) for the Riverine Assault Craft (RAC) and the Rigid Raiding Craft (RRC) and associated equipment at MCPD, Fallbrook. Engineering support for the Raw Water Cooling System (RWCS) for the RAC.		
(U)Total \$	5,821			
(U) FY 2000 Planned Program:				
• (U) \$	460	M1A1 Armor Mods: Continue joint evaluation of modifications of amphibious armor including Component Enhancements, Advanced Fire Control Systems, survivability systems, Operations and Support Cost Reduction opportunities, combat identification and others.		
• (U) \$	1676	Target Location Designator Hand-off System (TLDHS): Complete Joint-service, U.S. Army-led EMD development and IOT&E of the LLDR. Complete initial systems integration between the LLDR and the DACT/Command & Control Personal Computer. Continue incremental refinement, coding, evaluation and Independent Verification & Validation (IV&V) of the TLDHS-specific software application to ensure interoperability with emerging Marine Corps tactical C4I architecture and with other fire support platforms and agencies. Conduct IOT&E of artillery (Variable Message Format/Package 11) fire support functionality.		
• (U) \$	1047	Fire Support Mods: Continue joint participation in artillery and fire support improvement projects including joint sustainment of the M198 Howitzer and Meteorological Measuring Set (MMS). Continues software analysis and integration. Provide support to the Marine Corps Warfighting Lab for the development, evaluation and rapid transition of fire support initiatives.		
• (U) \$	1271	Infantry Wpns Mods: Continue joint participation and Marine Corps unique activities for evaluation of safety, lethality, and technology improvements for Marine Corps infantry/reconnaissance individual and crew served weapons. Pursue solutions to integrate weapons systems with existing and planned night vision and sighting technologies including revisions of mounts and interfaces. Continue weapon system integration into the Integrated Infantry Combat System (IICS) to enhance the efficiency, effectiveness and safety of the Combat System.		
• (U) \$	112	Thermal Weapons Sight (TWS)[AN/PAS-13]: Continue joint participation and Marine Corps unique activities for testing of the TWS.		
• (U) \$	623	Family of Small Craft: Provide Fault Analysis and Fault Isolation (FAFI) for the Riverine Assault Craft (RAC) and the Rigid Raiding Craft (RRC) and associated equipment at MCPD, Fallbrook, CA. Engineering support for the replacement engines for the RAC.		
• (U) \$	450	Night Vision Mod Line: Continue joint participation and Marine Corps unique activities for evaluation of safety, lethality and technology improvements for Marine Corps Night Vision Devices. Provides for In Service Engineering Activity (ISEA) at NSWC, Crane, IN. Participate with ARMY PM-Night Vision at Ft Belvoir, VA on new enhancements for image intensificaliton (I2). Travel/TAD to support enhanced systems development and review of tests.		
		R-1 Line Item 176		Budget Item Justification

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Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)			DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE	PROJECT	
7 - Operational System Development		0206623M Marine Corps Ground Combat/Supporting Arms Systems	C1901	
• (U) \$	265	Begin in-depth requirements analysis to establish the types and amounts of future ammunition required by the USMC. Establish active monitoring of US Army artillery ammunition development programs in order to leverage off and influence Army munitions R&D effort. Allow Marine Corps Operational Test and Evaluation Activity participation in all tests to collect/analyze data to support a procurement decision for M795 HE.		
• (U) \$	460	Improved Recovery Vehicle: For Landing Craft Air Cushion (LCAC) testing of Improved Recovery Vehicle.		
• (U) \$	6680	M1A1 Firepower Enhancements: Conduct trade studies to determine most cost effective upgrades to the tank fire control system. Initiate preliminary design of integrated NDI package to include improved thermal sight and north-finding/far target location capability. Begin fabrication/testing of prototype integrated system. Develop preliminary system specification, interface control documents, item development specification, conduct System Requirements Review (SRR)		
• (U) \$	200	Family of Improved Lightweight Mortars: In conjunction with Program manager for Mortars, conduct concept exploration initiatives to determine the feasibility of alternative concepts for the Pointing Device (PD) for the Mortar Fire Control System (Light) (MFCS). The PD provides precise deflection, elevation, and Global Positioning System interface for the MFCS. Will down-select to no more than two alternatives for further development.		
(U)Total \$	13,244			
(U) FY 2001 Planned Program:				
• (U) \$	266	M1A1 Armor Mods: Continue joint evaluation of modifications of amphibious armor including Component Enhancements, Advanced Fire Control Systems, survivability systems, combat identification and others.		
• (U) \$	735	Target Location Designator Hand-off System (TLDHS): Continue incremental refinement, coding, evaluation and IV&V of the TLDHS-specific software application to ensure interoperability with the emerging Marine Corps tactical C4I architecture and with other fire support platforms and agencies. Conduct IOT&E of close-air-support (JVMF format) functionality.		
• (U) \$	910	Fire Support Mods: Continue joint participation in artillery and fire support improvement projects. Specifically, continue joint sustainment of the M198 Howitzer, Meteorological Measuring System and Firefinder Radar to include safety modifications and service life extension efforts. Provide support to the Marine Corps Warfighting Lab for the development, evaluation and rapid transition of fire support initiatives.		
• (U) \$	834	Infantry Wpns Mods: Continued joint participation and Marine Corps unique activities for evaluation of safety, lethality, and technology improvements for Marine Corps infantry/reconnaissance individual and crew served weapons. Pursue solutions to integrate weapons systems with existing and planned night vision and sighting technologies including revisions of mounts and interfaces. Continue weapon system integration into the Integrated Infantry Combat System (IICS) to enhance the efficiency, effectiveness and safety of the Combat System.		
• (U) \$	114	Thermal Weapons Sight (TWS)[AN/PAS-13]: Provide for joint participation in P3I for TWS – remote image transfer, laser range finder, airport reticle, mounting brackets for future small arms weapons, vertical angle measurement, automated airport reticle.		
			R-1 Line Item 176	Budget Item Justification

R-1 Line Item 176

Budget Item Justification

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## RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE \_\_\_\_\_

February 2000

BUDGET ACTIVITY

PE NUMBER AND TITLE

# PROJECT

**C1901**

## 7 - Operational System Development

**0206623M Marine Corps Ground  
Combat/Supporting Arms Systems**

- |     |       |    |      |   |
|-----|-------|----|------|---|
| •   | (U)   | \$ | 585  | Family of Small Craft: Provide Fault Analysis and Fault Isolation (FAFI) for the Riverine Assault Craft (RAC) and the Rigid Raiding Craft (RRC) and associated equipment at MCPD, Fallbrook, CA. Engineering analysis and development for the replacement Intercom System for the RAC.  |
| •   | (U)   | \$ | 446  | Night Vision Mod Line: Continue joint participation and Marine Corps unique activities for evaluation of safety, lethality and technology improvements for Marine Corps Night Vision Devices. Provides for In Service Engineering Activity (ISEA) at NSWC, Crane. Participate with ARMY PM-Night Vision at Ft Belvoir on new enhancements for I2. Travel/TAD to support enhanced systems development and review of tests. |
| •   | (U)   | \$ | 269  | Continue in-depth requirements analysis to establish the types and amounts of future ammunition required by the USMC. Continue active monitoring of US Army artillery ammunition development programs in order to leverage off and influence Army munitions R&D effort.   |
| •   | (U)   | \$ | 3617 | Continue MCOTEA participation in all tests to collect/analyze data to support a procurement decision.   |
| •   | (U)   | \$ | 297  | Firepower Enhancements: Continue preliminary design of integrated NDI package to include improved thermal sight, automatic target tracker and north-finding far target location capability. Continue fabricating/testing of prototype integrated systems.   |
| •   | (U)   | \$ | 8073 | Family of Improved Lightweight Mortars. In conjunction with the Program Manager for Mortars, refine the PD for the MFCS. Develop alternatives for integrating the PD with the Commander's Interface.  |
| (U) | Total | \$ |      |   |

### B. (U) Project Change Summary

(U) Previous President's Budget

(U) Adjustments to Previous President's Budget

(U) Current Budget Submit

FY 1999	FY 2000	FY 2001
7462	24488	18695
-1641	-11244	-10622
5821	13244	8073

(U) Change Summary Explanation:

(U) Funding: FY 1999 decrease of \$1641, FY 2000 decrease of \$11,244 and FY 2001 decrease of \$10,622 due to reprioritization of programs within the Marine Corps including deletion of the AVLB and MBC programs and transfer of \$7.2M in FY 00 from R&D to PMC for the IRV program.

(U) Schedule: N/A

(U) Technical: N/A

**C. (U) Other Program Funding Summary  
(APPN, BLI #, NOMEN)**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To Compl	Total Cost
--	----------------	----------------	----------------	----------------	----------------	----------------	----------------	-------------	---------------

R-1 Line Item 176

### Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE	February 2000	PROJECT
BUDGET ACTIVITY		PE NUMBER AND TITLE										C1901
7 - Operational System Development		0206623M Marine Corps Ground Combat/Supporting Arms Systems										
C. (U) Other Program Funding Summary (APPN, BLI #, NOMEN)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost		
(U) PMC (BLI#206300) Modifications Kits (Tracked Vehicles)		7708	82762	20815	3793	3327	36145	38003		Cont.		
(U) PMC (BLI#210500) Items Less Than \$5 Million (Tracked Vehicles)		97	0	0	0	0	0	0	0	2040		
(U) PMC (BLI#220900) Modifications Kits (Arty & Other)		2803	3265	3891	1466	8195	9856	7247	Cont.	Cont.		
(U) PMC (BLI#221000) Items Less Than \$5 Million (Other)		105	0	0	0	0	0	0	0	1758		
(U) PMC (BLI#468300) AN/TPQ-36 Firefinder Radar Upgrades		588	0	0	0	0	0	0	0	34355		
*(U) PMC (BLI#493000) Night Vision Equipment		23586	17408	14351	22604	22528	25162	0	Cont.	Cont.		
(U) PMC (BLI#473300) Fire Support Systems		0	4964	12343	17530	17355	19028	0	0	67287		
(U) PMC (BLI#643400) Amphibious Raid Equipment		2797	0	0	0	0	0	0	0	2797		
(U) PMC (BLI#222000) Weapons and Combat Vehicles		0	321	415	252	303	315	321	Cont.	Cont.		
(U) PMC (BLI#462000) Items Less Than \$5M (Communications and Electronics)		0	11112	8320	6828	10215	9377	5497	Cont.	Cont.		
((U) PMC (BLI#667000) Items Less Than \$5M		0	12016	5591	7883	8081	9338	6261	Cont.	Cont.		
(U) PMC (BLI#206200) Improved Recovery Vehicle		0	0	42623	25019	25670	18782	752	0	112846		
(U) Related RDT&E												
(U) All Ground Weapons and Ground Ammunition Systems: Army, Navy, Air Force, Coast Guard, and Special Operations Command.												
R-1 Line Item 176										Budget Item Justification		

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DATE **February 2000**

**PROJECT  
C1901**

PE NUMBER AND TITLE  
0206623M Marine Corps Ground  
Combat/Supporting Arms Systems

R-1 Line Item 176

### Budget Item Justification

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[illegible]



<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 2000</b>
BUDGET ACTIVITY <b>7 - Operational System Development</b>	PE NUMBER AND TITLE <b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>	PROJECT <b>C1901</b>

T H E R M A L   W E A P O N S   S I G H T

	96		1997				1998				1999				2000				2001				2002				2003			
	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Army LRIP																														
USMC MS 0																														
Change 1 to O&O																														
ARMY OT																														
Develop/Staff LAP																														
Publish LAP																														
Develop LRFS																														
Revise LRFS																														
Update HARDMAN																														
ARMY MS III (LRIP/Bridge)																														
OMNIBUS Contract																														
Develop/Staff ULSS																														
OT III (USMC OT)																														
USMC MS I/III (ADM)																														
Contract Award																														

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 2000	
BUDGET ACTIVITY 7 - Operational System Development		PE NUMBER AND TITLE 0206623M Marine Corps Ground Combat/Supporting Arms Systems								PROJECT C1901	

TLDDHS

# Program Schedule

EVENT	FY 97				98				99				00				01				02				03				04				05			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Milestone I/II																																				
EMD Contract Award																																				
EMD Phase																																				
System Development LLDR																																				
System Development THS																																				
LLDR Test Article Delivery																																				
Test Phase																																				
LLDR LMMD																																				
LLDR DT Testing																																				
USMC Unique OT (MAWTS)																																				
LLDR Joint Service IOT&E																																				
IOT&E Artillery (VMF)																																				
IOT&E CAS (JVME)																																				
IOT&E Naval Surface Fire																																				
Army Milestone III LLDR																																				
USMC Production Decision LLDR																																				
Production Delivery																																				
TLDDHS MCPDM (Total System)																																				
IO C																																				
FO C																																				

R-1 Line Item 176

Budget Item Justification

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# RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

February 2000

BUDGET ACTIVITY

7 - Operational System Development

PE NUMBER AND TITLE

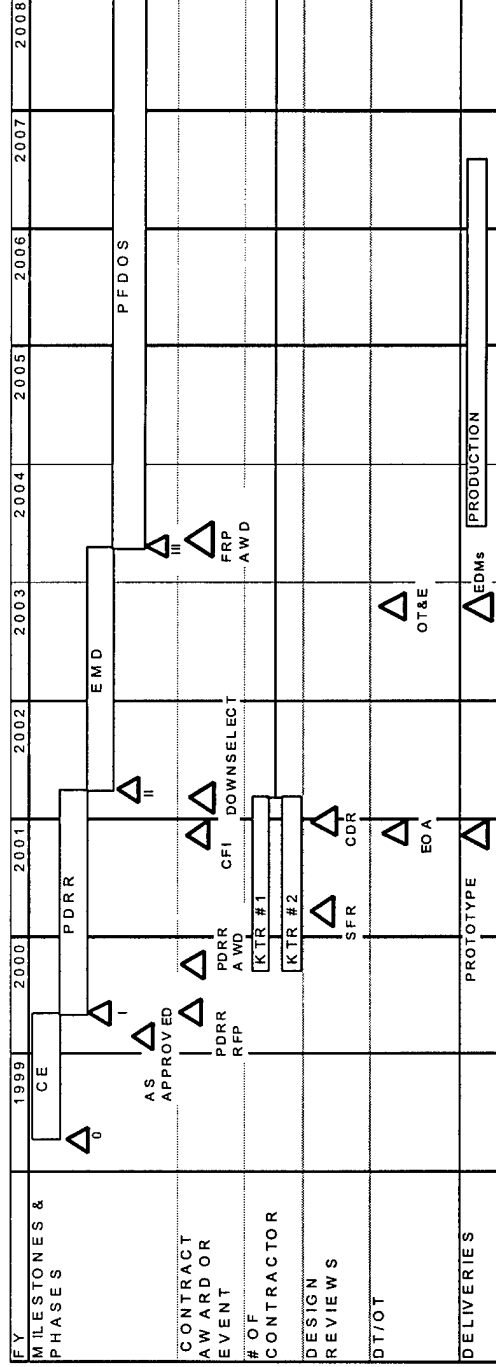
0206623M Marine Corps Ground  
Combat/Supporting Arms Systems

PROJECT

C1901

M1A1 FIREPOWER ENHANCEMENT

## Macro Program Schedule



R-1 Line Item 176

Budget Item Justification

(Exhibit R-2, Page 17 of 35)

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	February 2000	PROJECT
BUDGET ACTIVITY										PE NUMBER AND TITLE		
7 - Operational System Development										0206623M Marine Corps Ground Combat/Supporting Arms Systems		
A. (U) Project Cost Breakdown										FY 1999	FY 2000	FY 2001
Systems Engineering & Development										4249	10998	6265
Program Management and Support										580	1305	1260
Test and Evaluation										992	941	548
Total										5821	13244	8073
B. Budget Acquisition History and Planning Information												
Performing Organizations												
Contractor or Government	Contract Method/Type	Award or Obligation	Performing Activity	Project Office	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program		
Activity	Vehicle	Date	EAC	EAC								
Product Development Organizations												
Acquisition	WR/RCP	1 <sup>st</sup> Qtr			3988	240	310	290	CONT.	CONT.		
Logistics Support, Dumfries, VA												
NSWC, Crane, IN	WR/RCP	1 <sup>st</sup> Qtr			1399	190	190	190	CONT.	CONT.		
AMCOM, Huntsville, AL	MIPR	1 <sup>st</sup> Qtr			3851	300	340	225	CONT.	CONT.		
NSWC, Dahlgren, VA	WR/RCP	1 <sup>st</sup> Qtr			3575	300	250	275	CONT.	CONT.		
MCPD, Fall Brook, CA	WR/RCP	1st Qtr			703	380	580	540	CONT.	CONT.		
NSWC, Indian Head, MD	WR/RCP	1 <sup>st</sup> Qtr			425	375	410	345	CONT.	CONT.		
BENET LABS, Albany NY	MIPR	1 <sup>st</sup> Qtr			185	110	120	158	CONT.	CONT.		
PM NVRSTA, Ft Belvoir, VA	MIPR	1 <sup>st</sup> Qtr			1190	310	490	264	CONT.	CONT.		
U.S. Army CECOM, NJ	MIPR	1 <sup>st</sup> Qtr			290	630	210	55	CONT.	CONT.		
R-1 Line Item 176										Budget Item Justification		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE		February 2000		
BUDGET ACTIVITY			PE NUMBER AND TITLE										PROJECT	
7 - Operational System Development			0206623M Marine Corps Ground Combat/Supporting Arms Systems										C1901	
			125	115	120	120	120	120	120	120	CONT.	CONT.		
Rock Island Arsenal, IL	MIPR	1st Qtr												
MCTSSA, Camp Pendleton, CA	WR/RCP	1st Qtr	1018	1009	878	97							CONT.	
MCCDC, Quantico, VA	WR	1st Qtr	3968	290	325	215							CONT.	
ARDEC	MIPR	1st Qtr	0	0	125	126							CONT.	
UDLP	MIPR	2ND Qtr	0	0	55	0						0	0	
York, PA (IRV)														
KR TBD	Comp/CPFF	JUL 00	10745	10745	0	0	5905	2875	3945	10745				
(M1A1 Firepower)														
Night Vision Lab	MIPR	Nov 99	0	0	200	200							CONT.	
Ft Belvoir, VA														
(M1A1 Firepower)														
PM Mortars (Ktr TBD)	FFP	TBD	580	580	0	0	190	290	100	580				
Center for Naval Analysis	RFP	2nd Qtr	0	0	300	0							0	
(M1A1 Mod)														
Misc			3042	0	0	0	0	0	0	0			0	
Total Product Development			23759	4249	10998	6265								
Support and Management Organizations														
Acquisition	WR/RCP	Various	20036	580	640	645							CONT.	
Logistics Support, Dumfries, VA														
MCCDC	WR	1st Qtr	0	0	30	30							CONT.	
R-1 Line Item 176										Budget Item Justification				

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE									PROJECT
7 - Operational System Development		0206623M Marine Corps Ground Combat/Supporting Arms Systems									C1901
Acquisition	RCP	Various	0	0	0	0	50	0	0	0	0
Logistics Support, Dumfries, VA (IRV)											
Acquisition	RCP	Various	300	300	0	0	75	75	150	300	
Logistics Support, Dumfries, VA (M1A1 Firepower)											
GDLS, Warren, MI (M1A1 Firepower)	MIPR	1 <sup>st</sup> Qtr			0	0	500	500	CONT.	CONT.	
ALS (Mortars)	RCP	TBD	20	20	0	0	10	10	0	20	
Total Support and Management					20036	580	1305	1260	CONT.	CONT.	
Test and Evaluation											
Organizations											
AMCOM, Huntsville, AL	MIPR	1 <sup>st</sup> Qtr			5310	0	0	0	CONT.	CONT.	
CECOM, New Jersey	MIPR	1 <sup>st</sup> Qtr			150	0	0	0	CONT.	CONT.	
MCCDC, Quantico, VA	WR/RCP	1 <sup>st</sup> Qtr			5560	700	230	150	CONT.	CONT.	
MCPD, Fallbrook, CA	WR/RCP	1 <sup>st</sup> Qtr			341	0	18	20	CONT.	CONT.	
NSWC , Dahlgren, VA	WR/RCP	1 <sup>st</sup> Qtr			4985	150	155	125	CONT.	CONT.	
NSWC, Crane, IN	WR/RCP	1 <sup>st</sup> Qtr			1767	75	125	100	CONT.	CONT.	
PM NVRSTA, Ft Belvoir, VA	MIPR	1 <sup>st</sup> Qtr			0	50	0	50	CONT.	CONT.	
R-1 Line Item 176										Budget Item Justification	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE								PROJECT	
7 - Operational System Development		0206623M Marine Corps Ground Combat/Supporting Arms Systems								C1901	
MCOTEA, Quantico, VA		1100	1100	0	0	50	50	CONT.	CONT.		
MCOTEA, Quantico, VA (IRV)		WR		0	0	88	0	1100	1100		
Coastal Sys Station, Panama, City, FL (IRV)		WR	1 <sup>st</sup> Qtr	0	0	260	0	CONT.	CONT.		
MCOTEA, Quantico, VA (M1A1 Firepower)		WR		0	0	0	0	1000	1000		
Misc		Various	Various	4606	17	15	53	CONT.	CONT.		
Total Test & Eval				22719	992	941	548	CONT.	CONT.		
Government Furnished Property N/A											
Contract											
Item	Method/Type	Award or	Delivery	Total		FY 1999		FY 2000		FY 2001	
Description	or Funding	Obligation	Date	Prior to		FY 1999		FY 2000		FY 2001	
Vehicle	Vehicle	Date	Date	FY 1999		FY 1999		FY 2000		FY 2001	
Product Development Property											
Support and Management Property											
Test and Evaluation Property											
R-1 Line Item 176										Budget Item Justification	

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE								PROJECT	
7 - Operational System Development		0206623M Marine Corps Ground Combat/Supporting Arms Systems								C2086	
COST (In Millions)		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost	
C2086 Marine Enhancement Program		3575	1475	1656	2604	2498	2813	2862	Continuing	Continuing	
Quantity of RDT&E Articles											
<p><b>A. (U) Mission Description and Budget Item Justification:</b></p> <p>(U) This program was formerly titled Soldier/Marine Enhancement. MEP provides Research, Development, Test and Evaluation funding for low visibility, low cost items. It focuses on items of equipment which will benefit the individual Marine by reducing the load, increasing survivability, enhancing safety and improving combat effectiveness. The emphasis of the program is on non-developmental/commercially available items which can be quickly evaluated and fielded. This program is coordinated with the Army's Soldier Enhancement Program and the Special Operations Command.</p> <p><b>(U) FY 1999 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 510 Continued to explore NDI equipment that will improve the combat effectiveness and enhance safety and survivability of the Individual Marine.</li> <li>• (U) \$ 556 Continued to explore clothing and individual equipment NDI categories.</li> <li>• (U) \$ 509 Continued to explore ground weapons, communications and command and control equipment NDI categories.</li> <li>• (U) \$ 250 Continued development of prototype model for the Medical Forward Resuscitative Surgery System (MFRSS)</li> <li>• (U) \$ 1750 Explored initial issue clothing and individual equipment categories.</li> <li>(U)Total \$ 3,575</li> </ul> <p><b>(U) FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 502 Continue to explore NDI equipment that will improve the combat effectiveness and enhance safety and survivability of the Individual Marine.</li> <li>• (U) \$ 465 Continue to explore clothing and individual equipment NDI categories.</li> <li>• (U) \$ 508 Continue to explore ground weapons, communications and command and control equipment NDI categories.</li> <li>(U)Total \$ 1,475</li> </ul> <p><b>(U) FY 2001 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 566 Continue to explore NDI equipment that will improve the combat effectiveness and enhance safety and survivability of the Individual Marine.</li> </ul>											
R-1 Line Item 176										Budget Item Justification	

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## UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT	
<b>7 - Operational System Development</b>	<b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>	<b>C2086</b>	
<ul style="list-style-type: none"> <li>(U) \$ 543 Continue to explore clothing and individual equipment NDI categories.</li> <li>(U) \$ 547 Continue to explore ground weapons, communications and command and control equipment NDI categories.</li> <li>(U) Total \$ 1,656</li> </ul>			
<b>B. (U) Project Change Summary</b> (U) Previous President's Budget (U) Adjustments to Previous President's Budget (U) Current Budget Submit			
		FY 1999 3009 566 3575	FY 2000 1484 -9 1475
			FY 2001 1672 -16 1656
(U) Change Summary Explanation:			
(U) Funding: FY 99: Increase in the amount of \$566K is due to reprioritization of programs within the Marine Corps. FY00 and FY01 decreases are due to minor affordability adjustments.			
(U) Schedule: N/A			
(U) Technical: N/A			
<b>C. (U) Other Program Funding Summary</b> (APPN, BLI #, NOMEN) (U) PMC (BLI #221100) MEP (U) O&M Initial Issue Active (U) O&M Initial Issue Reserve (U) Related RDT&E: PE 0604713A (Combat Feeding, Clothing and Equipment)			
		FY 1999 2070 65593 12293	FY 2000 2935 44693 15523
			FY 2001 6413 32173 12758
			FY 2002 2217 27662 7749
			FY 2003 4159 28288 7900
			FY 2004 4077 28808 7997
			FY 2005 4140 29442 8095
		To Compl Cont. Cont.	Total Cost Cont. Cont.
<b>D. (U) Schedule Profile: N/A</b>			

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Budget Item Justification

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## RDT&amp;E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

DATE \_\_\_\_\_

February 2000

## BUDGET ACTIVITY

**PROJECT  
C2086**

## 7 - Operational System Development

PE NUMBER AND TITLE

**0206623M Marine Corps Ground  
Combat/Supporting Arms Systems**

<b><u>A. (U) Project Cost Breakdown</u></b>	<b><u>FY 1999</u></b>	<b><u>FY 2000</u></b>	<b><u>FY 2001</u></b>
Systems Engineering	418	136	150
Development Test and Evaluation	726	277	326
Program Management and Support	453	295	330
Integrated Logistics Support	619	302	345
Test/Evaluations	541	141	144
Government Engineering Support	504	213	234
Miscellaneous	314	111	138
<b>Total</b>	<b>3575</b>	<b>1475</b>	<b>1656</b>

### B. Budget Acquisition History and Planning Information

## Performing Organizations

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity <u>EAC</u>	Project Office <u>EAC</u>	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
<b>Product Development Organizations</b>										
Lexington – Bluegrass	WR	1 <sup>st</sup> Qtr			2357	35	42	48	Cont.	Con't
Lexington, KY										
NOC PacDiv	WR	1 <sup>st</sup> Qtr			173	86	30	35	Con't	Con't
Fallbrook, CA										
MCTSSA CamPen, CA	WR/RCP	1 <sup>st</sup> Qtr			604	22	4	5	Con't	Con't
NCTRF, Aberdeen, MD	WR/RCP	1 <sup>st</sup> Qtr			299	25	21	21	Con't	Con't
NATICK, Natick, MA	MIPR	2 <sup>nd</sup> Qtr			1298	492	60	70	Con't	Con't

R-1 Line Item 176

### Budget Item Justification

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)					DATE	February 2000	PROJECT
BUDGET ACTIVITY		PE NUMBER AND TITLE		PROJECT			
7 - Operational System Development		0206623M Marine Corps Ground Combat/Supporting Arms Systems		C2086			
MCCDC, Quantico, VA	WR	1 <sup>st</sup> Qtr	2039	192	37	37	Con't
MISC	Various	Various	4434	60	40	41	Con't
<b>Test and Evaluation Organizations</b>							
MCTSSA, CampPen, CA	WR/RCP	1 <sup>st</sup> Qtr	1818	47	24	24	Con't
NCTRF, Aberdeen, MD	WR/RCP	1 <sup>st</sup> Qtr	851	3	5	5	Con't
NATICK, Natick, MA	MIPR	2 <sup>nd</sup> Qtr	2470	750	125	185	Con't
ARL/APG, Aberdeen, MD	MIPR	1 <sup>st</sup> Qtr	801	19	12	14	Con't
PM, Mortors, Ft. Monmouth, NJ	MIPR	1 <sup>st</sup> Qtr	1803	0	0	0	Con't
PPSC, Philadelphia, PA	MIPR	3 <sup>rd</sup> Qtr	46	0	4	5	Con't
MCAGCC	WR/RCP	1 <sup>st</sup> Qtr	351	18	8	10	Con't
Twenty-Nine Palms, CA							
NSMA, Washington, DC	MIPR	1 <sup>st</sup> Qtr	539	43	21	21	Con't
TACOM, Warren, MI	MIPR	1 <sup>st</sup> Qtr	199	25	21	21	Con't
NHRC, Crane, IN	MIPR	2 <sup>nd</sup> Qtr	1473	380	150	200	Con't
2 <sup>nd</sup> MarDiv, CamLej, NC	WR	1 <sup>st</sup> Qtr	224	10	12	12	Con't
NCCOSC, San Diego, CA	WR	1 <sup>st</sup> Qtr	674	31	36	36	Con't
NCSS, Panama City, FL	WR	1 <sup>st</sup> Qtr	6192	15	15	15	Con't
R-1 Line Item 176			Budget Item Justification				

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## UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)					DATE	February 2000	PROJECT
BUDGET ACTIVITY	PE NUMBER AND TITLE						
<b>7 - Operational System Development</b>	<b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>						
NSWC, Crane, IN	WR	1 <sup>st</sup> Qtr	6560	410	260	284	Con't
NAWC Air Div, Patuxent River, MD	WR	1 <sup>st</sup> Qtr	788	154	162	176	Con't
II MEF CamLej, NC	WR	1 <sup>st</sup> Qtr	5506	0	0	0	Con't
NFESC, San Diego CA	MIPR	2 <sup>nd</sup> Qtr	1139	0	0	0	Con't
NSWC IHD, Indian Head, MD	WR	4 <sup>th</sup> Qtr	556	10	10	10	Con't
MISC	Various	Various	8851	90	196	206	Con't
<b>Government Furnished Property</b>							
Contract							
Item Description	Method/Type or Funding Vehicle	Award or Obligation Date	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete
							Total Program
<b>Product Development Property</b>							
Not Applicable							
<b>Support and Management Property</b>							
<b>Test and Evaluation Property</b>							
Subtotal Product Development							
Subtotal Support and Management							
Subtotal Test and Evaluation							
Total Project							
			Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete
							Total Program
			11277	1318	337	354	Con't
			6473	252	77	78	Con't
			40741	2005	1061	1224	Con't
			58491	3575	1475	1656	Con't
<b>R-1 Line Item 176</b>							
							Budget Item Justification

(Exhibit R-3, Page 28 of 35)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE								PROJECT	
7 - Operational System Development		0206623M Marine Corps Ground Combat/Supporting Arms Systems								C2237	
COST (In Millions)		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost	
C2237	Amphibious Vehicle Test Branch	625	639	724	729	742	816	820	Continuing	Continuing	
	Quantity of RDT&E Articles										
<p><b>A. (U) <u>Mission Description and Budget Item Justification:</u></b></p> <p>(U) The Amphibious Vehicle Test Branch (AVTB) is a one-of-a-kind Department of Defense test facility for amphibious vehicles and supports the requirements of all Services. The AVTB conducts developmental/operational, and follow-on testing and evaluation of production hardware. It also conducts Product Assurance Testing and Substitute or alternative parts and material testing for amphibious vehicles and associated equipment. Because of its year-round temperate climate, diverse terrain, and 17 miles of coastline, the AVTB is ideal for amphibious vehicle, as well as ship related testing. The AVTB is in close proximity to San Clemente island which is used frequently for live fire sea-to-shore testing and high-speed water testing. The AVTB is committed to testing product improvement programs, engineering change proposal design changes, and field change requests.</p> <p><b>(U) FY 1999 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 474 Program support, supplies and services at AVTB test site supported scheduled Amphibious Assault Vehicle 7A1 (AAV7A1) "rebuild to standard" testing, Advanced Amphibious Assault Vehicle (AAAV) Development Testing as well as other Marine Corps mobility and mine warfare programs. Program on-site support, supplies, and services supported Naval Sea System Command and Naval Mine Warfare Command for development testing of Navy mine countermeasures system. Provided services and support to the Department of Defense Common Test and Training Range Architecture workshops. These funds provided organic supply support including management operations, general accounting, and a maintenance float of equipment. Provided intermediate maintenance (third echelon) of organic non-developmental communication electronic and ordnance equipment.</li> <li>• (U) \$ 151 Provided funding for necessary services provided by Marine Corps Base, Camp Pendleton (MCB CAMPEN), California and off-station units for electricity, heating, and other power charges; long distance telephone support; and calibration of laboratory test equipment and maintenance.</li> </ul> <p>(U) Total \$ 625</p>											

R-1 Line Item 176

Budget Item Justification

(Exhibit R-2, Page 29 of 35)

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## UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT	
7 - Operational System Development	0206623M Marine Corps Ground Combat/Supporting Arms Systems	C2237	
(U) FY 2000 Planned Program:			
• (U) \$	490	Maintenance, refurbishment, upgrade, and replacement of test equipment and instrumentation needed to provide program support, supplies, and services at AVTB test site to support scheduled and unscheduled Assault Amphibious Vehicle 7A1 (AAV7A1) component testing, Advanced Assault Amphibious Vehicle (AAAV) Development Testing as well as other Marine Corps mobility and mine warfare programs. Upgrade instrumentations for over the horizon capability in developing weapons systems to support operational maneuver from the sea. Program on-site support, supplies, and services to support Naval Sea System Command and Naval Mine Warfare Command for development testing of Navy mine countermeasures system. Provide services and support to the Department of Defense Common Test and Training Range Architecture workshops. These funds provide organic supply support including management operations, general accounting, and a maintenance float of equipment. Provide intermediate maintenance (third echelon) of organic non-development communication electronic and ordnance equipment.	
• (U) \$	149	Provide funding for necessary services provided by Marine Corps Base, Camp Pendleton (MCB CAMPEN), California for electricity, heating, and other power charges; and long distance telephone support. Provide funding for calibration of laboratory test equipment and maintenance services provided by Marine Corps Logistics Bases (MCLB) Barstow and 1FSSG.	
(U)Total \$	639		
(U) FY 2001 Planned Program:			
• (U) \$	569	Maintenance, refurbishment, upgrade, and replacement of test equipment and instrumentation needed to provide program support, supplies, and services at AVTB test site to support scheduled and unscheduled Assault Amphibious Vehicle 7A1 (AAV7A1) component testing, Advanced Assault Amphibious Vehicle (AAAV) Development Testing Light Armored Vehicle Service Life Extension Program as well as other Marine Corps mobility and mine warfare programs. Upgrade instrumentation for over the horizon capability in developing weapons systems to support operational maneuver from the sea. Program on-site support, supplies, and services to support Naval Sea System Command and Naval Mine Warfare Command for development testing of Navy mine countermeasures system. Provide services and support to the Department of Defense Common Test and Training Range Architecture workshops. These funds provide organic supply support including management operations, general accounting, and a maintenance float of equipment. Provide intermediate maintenance (third echelon) of organic non-development communication electronic and ordnance equipment .	
• (U) \$	155	Provide funding for necessary services provided by Marine Corps Base, Camp Pendleton (MCB CAMPEN), California for electricity, heating, and other power charges; and long distance telephone support. Provide funding for calibration of laboratory test equipment and maintenance services provided by MCLB Barstow and 1 Force Service Support Group (FSSG).	
(U)Total \$	724		
		R-1 Line Item 176	Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000																																				
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT																																					
7 - Operational System Development	0206623M Marine Corps Ground Combat/Supporting Arms Systems	C2237																																					
<p><b>B. (U) <u>Project Change Summary</u></b></p> <table border="0"> <thead> <tr> <th></th> <th>FY 1999</th> <th>FY 2000</th> <th>FY 2001</th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget</td> <td>1960</td> <td>643</td> <td>722</td> </tr> <tr> <td>(U) Adjustments to Previous President's Budget</td> <td>-1335</td> <td>-4</td> <td>+2</td> </tr> <tr> <td>(U) Current Budget Submit</td> <td>625</td> <td>639</td> <td>724</td> </tr> </tbody> </table> <p>(U) Change Summary Explanation:</p> <p>(U) Funding: FY 1999 Decrease in the amount of \$1328K is due to reprioritization of programs within the Marine Corps and a decrease of \$7K decrease is for SBIR tax assessment. FY00 \$4K decrease due to minor affordability adjustments. FY01 \$2K increase due to NWCF rate change.</p> <p>(U) Schedule: N/A</p> <p>(U) Technical: N/A</p> <p><b>C. (U) <u>Other Program Funding Summary</u></b> (APPN, BLI #, NOMEN)</p> <table border="0"> <thead> <tr> <th></th> <th>FY 1999</th> <th>FY 2000</th> <th>FY 2001</th> <th>FY 2002</th> <th>FY 2003</th> <th>FY 2004</th> <th>FY 2005</th> <th>To Compl</th> <th>Total Cost</th> </tr> </thead> <tbody> <tr> <td>(U) Not Applicable</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>(U) <b>Related RDT&amp;E:</b> PE 0603611M (Marine Corps Assault Vehicles)</p> <p><b>D. (U) <u>Schedule Profile</u></b></p> <p>Testing conducted at AVTB includes all aspects of Marine Corps Assault Amphibious Vehicles. Testing planned for FY 00 and beyond includes MK 155 Minefield Breaching System, NBC overpressure system, RAM/RS (Reliability, Availability and Maintainability/Rebuild to Standard) Proof of Principle Developmental Testing, Operational Testing Support and Production Assurance testing. Engineering Change Proposals (ECP) as required; combined Recoil Booster (CRB) for adoption of Multiple Integrated Laser Engagement System (MILES) for AAV use; upgrade instrumentation for over the horizon capability in developing weapons systems to support operational maneuver from the sea, support for the Light Armored Vehicle Service Life Extension Program; C4I integrated support for AAV Communications and 7 RAM/RS. AVTB will also support the testing of the Advanced Amphibian Assault Vehicle (AAAV) as directed, by DRPM AAA, during the Program Definition &amp; Risk Reduction phase of the AAAV Program Development</p>					FY 1999	FY 2000	FY 2001	(U) Previous President's Budget	1960	643	722	(U) Adjustments to Previous President's Budget	-1335	-4	+2	(U) Current Budget Submit	625	639	724		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost	(U) Not Applicable									
	FY 1999	FY 2000	FY 2001																																				
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(U) Not Applicable																																							
		R-1 Line Item 176	Budget Item Justification																																				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE								PROJECT	
7 - Operational System Development		0206623M Marine Corps Ground Combat/Supporting Arms Systems								C2503	
COST (In Millions)		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost	
C2503	Initial Issue	0	1613	1416	1301	1104	1127	1150	Continuing	Continuing	
Quantity of RDT&E Articles											
<p><b>A. (U) Mission Description and Budget Item Justification:</b> This program was formerly reported under C2086, Marine Enhancement Program. The Initial Issue program provides Research, Development, Test and Evaluation of low visibility, low cost items with emphasis on non-developmental/commercial available items. Items approved for procurement will transition into the O&amp;M Initial Issue program. Focus is on clothing and equipment items (i.e. improved Jungle and Desert Boots, Light Weight Helmet, combat boots, sleeping bags) which will benefit the individual Marine by reducing the load with less bulky, lightweight, comfortable equipment, increasing survivability and improving combat effectiveness. Initial Issue continues to explore the spectrum of technologies commercially available that can provide enhancement in individual protection, tactical mobility and application of state-of-the-art technologies through studies and testing.</p> <p><b>(U) FY 1999 Accomplishments:</b> This program is contained in Project C2086 in this PE.</p> <p><b>(U) FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 1016 Explore and evaluate across a broad spectrum of commercially available technologies that can be incorporated into existing or new designs of individual clothing and equipment in an effort to reduce weight, increase survivability, increase lethality, improve safety, increase mobility, and improve combat performance of the individual Marine. (Marine load system product improvement, redesign, conduct testing and evaluation; improve jungle and desert boot; conduct boot outsole traction study to optimize performance of boot soles for traction, durability, and resole-ability; Body armor and light weight helmet ballistic testing to include cadaver testing and analysis of ballistic effects of shock forces of the torso, neck and spine; Review uniform sizing integration (less sizes covering same population with potential cost savings associated with stock and storage). Provide recommendation to uniform board on Marine uniform product improvements in an effort to reduce cost, utilize commercial manufacturing techniques, improve durability, and retain sharp appearance.</li> <li>• (U) \$ 98 Begin research and development of a lighter, easier to use, Digital Radiology System that will store data electronically.</li> <li>• (U) \$ 499 Conduct validation of the model and testing of the Forward Resuscitative Surgery System prototypes.</li> <li>(U) Total \$ 1,613</li> </ul>											
R-1 Line Item 176										Budget Item Justification	

(Exhibit R-2, Page 32 of 35)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT	
<b>7 - Operational System Development</b>	<b>0206623M Marine Corps Ground Combat/Supporting Arms Systems</b>	<b>C2503</b>	
<p>(U) <b>FY 2001 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 1033 Continue to validate and incorporate commercial technologies into individual combat clothing and equipment. Conduct comparative analysis through boot study (fatigue, shear force, injury rates, energy consumption) of new infantry combat boots and existing foot wear. Conduct study/analysis of the Army's Land Warrior program for commercial technology insertion to complement the Marine Corps Integral Combat System (our version of Land Warrior). Evaluate commercial power source/recharging systems through individual movement (Piezoelectrics). Evaluate and incorporate cost-effective commercial fabric technologies into the Battle Dress uniform.</li> <li>• (U) \$ 284 Complete development and test of the Forward Resuscitative Surgery System.</li> <li>• (U) \$ 99 Continue development and providing test data to Medical Community for acceptance.</li> <li>(U) Total \$ 1416</li> </ul>			
<b>B. (U) <u>Project Change Summary</u></b>		<u>FY 1999</u>	<u>FY 2000</u> <u>FY 2001</u>
(U) Previous President's Budget		0	1222      1432
(U) Adjustments to Previous President's Budget		0	391      -16
(U) Current Budget Submit		0	1613      1416
<p>(U) Change Summary Explanation:</p> <p>(U) Funding: FY00 adjustment of +400K provides funds for validation testing of Forward Resuscitative Surgery System prototype and -9K for general reductions and Non-Purchase Inflation. Collectively a net Increase of \$391K. FY01 reduction of \$16K for PBD 604 and Non-Purchase Inflation Adjustment.</p> <p>(U) Schedule: Not Applicable.</p> <p>(U) Technical: Not Applicable.</p>			
<b>C. (U) <u>Other Program Funding Summary</u></b> (APPN, BLI #, NOMEN)		<u>FY 1999</u>	<u>FY 2000</u> <u>FY 2001</u> <u>FY 2002</u> <u>FY 2003</u> <u>FY 2004</u> <u>FY 2005</u>
(U) PMC Line (BLI#652200) Field Med Equip		0	0      0      1108      4744      3212      0
(U) O&M Initial Issue		65593	44693      32173      27662      28188      28808      29442
<b>(U) Related RDT&amp;E:</b> Not Applicable.			
<b>D. (U) <u>Schedule Profile:</u></b> Not Applicable.			
R-1 Line Item 176		Budget Item Justification	

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE		February 2000		PROJECT			
BUDGET ACTIVITY										PE NUMBER AND TITLE							
7 - Operational System Development										0206623M Marine Corps Ground Combat/Supporting Arms Systems							
A. (U) Project Cost Breakdown										FY 1999		FY 2000		FY 2001			
Product Development										0		921		1048			
Product Test										0		692		368			
Total										0		1613		1416			
B. Budget Acquisition History and Planning Information																	
Performing Organizations																	
Contractor or Government																	
Performing Activity																	
Method/Type or Funding Vehicle																	
Award or Obligation Date																	
Performing Activity																	
Product Development Organizations																	
NATICK																	
MIPR																	
USAMRA																	
Support and Management Organizations																	
Test and Evaluation Organizations																	
NATICK																	
MIPR																	
AMED																	
Government Furnished Property																	
Contract																	
Method/Type or Funding Vehicle																	
Award or Obligation Date																	
Item Description																	
Product Development Property																	
Support and Management Property																	
Test and Evaluation Property																	

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## RDT&amp;E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

DATE February 2000

## BUDGET ACTIVITY

## 7 - Operational System Development

PE NUMBER AND TITLE

**0206623M Marine Corps Ground  
Combat/Supporting Arms Systems**

**PROJECT  
C2503**

Subtotal Product Development	<u>Total Prior to FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Subtotal Support and Management	0	0	921	1048	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	0	0	692	368	0	0
	0	0	1613	1416	0	0

R-1 Line Item 176

### Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE	February 2000
BUDGET ACTIVITY					PE NUMBER AND TITLE						
7 - Operational System Development					0206624M Marine Corps Combat Services Support						
COST (In Millions)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost		
Total Program Element (PE) Cost	5536	8337	2854	15304	5129	1360	271	Continuing	Continuing		
Medium Tactical Vehicle Replacement (MTVR)	2516	6776	1027	2026	1	1	1	0	31682		
C0200 Light Tactical Vehicle Replacement (LTVR)	1	0	0	0	0	0	0	0	186		
C0201 Logistical Vehicle System Replacement (LVSR)	1873	1049	1064	12888	4711	1096	2	0	22683		
C2316 Combat Services Support Engineering Equipment	1146	267	515	138	159	0	0	0	2952		
C2509 Motor Transport Modification	0	245	248	252	258	263	268	Continuing	Continuing		
Quantity of RDT&E Articles											
<p>(U) <b>Mission Description and Budget Item Justification:</b> This program element (PE) provides funding for Marine Air-Ground Task Force requirements for Combat Service Support equipment improvement. It will enhance combat breaching capabilities of the ground combat elements, provide potable water from any available raw water source, logistics, maintenance and transportation requirements. It will also determine the reconfiguration of the current Twin Agent Unit firefighting apparatus and provide a portable, highly mobile general purpose automatic tester designed for use by technicians in the garrison and at the forward edge of the battlefield. The PE also provides improvements in all areas of Combat Service Support Equipment Vehicles by determining the replacement for the heavy, medium and light fleet vehicles.</p> <p>(U) <b>Justification for Budget Activity:</b> This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing operational systems.</p>											
R-1 Line Item 177										Budget Item Justification	

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## UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE								PROJECT	
7 - Operational System Development		0206624M Marine Corps Combat Services Support								C0076	
	COST (In Millions)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost	
C0076	Medium Tactical Vehicle Replacement (MTVR)	2516	6776	1027	2026	1	1	1	0	31682	
Quantity of RDT&E Articles			8								
<p><b>A. (U) Mission Description and Budget Item Justification:</b> The Medium Tactical Vehicle Replacement (MTVR) Program will determine the replacement vehicle for the Medium 5-ton fleet. This project will increase mobility, maintainability, and reliability for the medium fleet.</p> <p><b>(U) FY 1999 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 2315 Began variant prototype development.</li> <li>• (U) \$ 58 Traveled in support of the MTVR program.</li> <li>• (U) \$ 103 Program documentation and management support for the MTVR program.</li> <li>• (U) \$ 40 Engineering Study.</li> <li>(U)Total \$ 2,516</li> </ul> <p><b>(U) FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 4961 Complete MTVR variant prototype development.</li> <li>• (U) \$ 1501 Initial Operational Test and Evaluation.</li> <li>• (U) \$ 120 Travel in support of the MTVR program.</li> <li>• (U) \$ 194 Program documentation and management support for the MTVR program.</li> <li>(U)Total \$ 6,776</li> </ul> <p><b>(U) FY 2001 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 760 Start MTVR variant prototype testing.</li> <li>• (U) \$ 95 Travel in support of the MTVR program.</li> <li>• (U) \$ 172 Program documentation and management support for the MTVR program.</li> <li>(U)Total \$ 1,027</li> </ul>											

R-1 Line Item 177

Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000																				
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT																					
7 - Operational System Development	0206624M Marine Corps Combat Services Support	C0076																					
<p><b>B. (U) Project Change Summary</b></p> <table border="0"> <tr> <td>(U) Previous President's Budget</td> <td>FY 1999</td> <td>FY 2000</td> <td>FY2001</td> </tr> <tr> <td></td> <td>1,925</td> <td>6814</td> <td>1543</td> </tr> <tr> <td>(U) Adjustments to Previous President's Budget</td> <td>591</td> <td>-38</td> <td>-516</td> </tr> <tr> <td>(U) Current Budget Submit</td> <td>2516</td> <td>6776</td> <td>1027</td> </tr> </table>				(U) Previous President's Budget	FY 1999	FY 2000	FY2001		1,925	6814	1543	(U) Adjustments to Previous President's Budget	591	-38	-516	(U) Current Budget Submit	2516	6776	1027				
(U) Previous President's Budget	FY 1999	FY 2000	FY2001																				
	1,925	6814	1543																				
(U) Adjustments to Previous President's Budget	591	-38	-516																				
(U) Current Budget Submit	2516	6776	1027																				
<p>(U) Change Summary Explanation:</p> <p>(U) Funding: FY99 increase for variant prototype development. FY00 decrease of \$38K is due to minor affordability adjustments. FY01 decrease \$516K reflects a -\$508K due to prioritization of programs within the Marine Corps and -\$8K due to minor affordability adjustments.</p> <p>(U) Schedule: N/A</p> <p>(U) Technical: N/A</p>																							
<p><b>C. (U) Other Program Funding Summary</b></p> <p>(APPN, BLI #, NOMEN)</p> <table border="0"> <tr> <td>(U) PMC Line (BLI# 508800) MTVR</td> <td>FY 1999</td> <td>FY 2000</td> <td>FY 2001</td> <td>FY 2002</td> <td>FY 2003</td> <td>FY 2004</td> <td>FY 2005</td> <td>To Compl</td> <td>Total Cost</td> </tr> <tr> <td></td> <td>69522</td> <td>138268</td> <td>325582</td> <td>311769</td> <td>380491</td> <td>5803</td> <td>522</td> <td>0</td> <td>1232842</td> </tr> </table>				(U) PMC Line (BLI# 508800) MTVR	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost		69522	138268	325582	311769	380491	5803	522	0	1232842
(U) PMC Line (BLI# 508800) MTVR	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost														
	69522	138268	325582	311769	380491	5803	522	0	1232842														
<p><b>(U) Related RDT&amp;E</b></p> <p>(U) PE 0206623M Marine Corps Ground Combat Supporting Arms Systems</p> <p>(U) PE 0603640M Marine Corps Advanced Technology Demonstration</p> <p>(U) PE 0604804A Logistics and Engineering Equip/Engr Development</p> <p>(U) PE 0206313M Marine Corps Communications</p>																							
		R-1 Line Item 177	Budget Item Justification																				



# RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

February 2000

BUDGET ACTIVITY

7 - Operational System Development

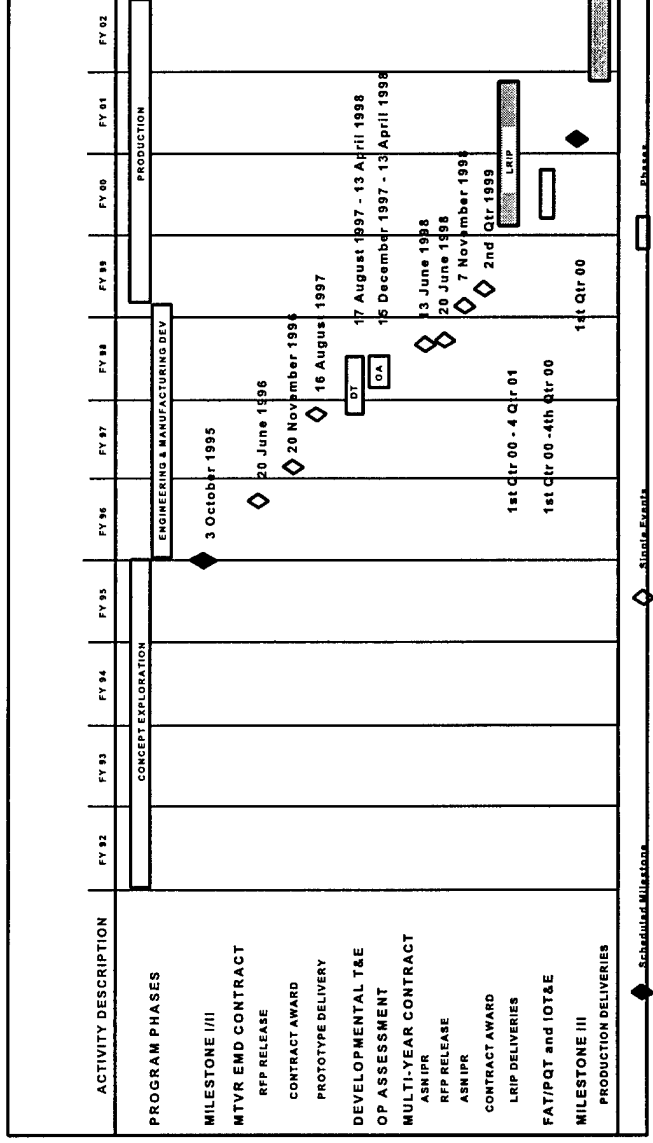
PE NUMBER AND TITLE

0206624M Marine Corps Combat Services Support

PROJECT

C0076

## MEDIUM TACTICAL VEHICLE REPLACEMENT SCHEDULE



D. (U) Schedule Profile:

R-1 Line Item 177

Budget Item Justification

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)					DATE	February 2000	PROJECT
BUDGET ACTIVITY		PE NUMBER AND TITLE			C0076		
7 - Operational System Development		0206624M Marine Corps Combat Services Support					
A. (U) Project Cost Breakdown							
Product Development		FY 1999	FY 2000	FY 2001			
		2315	4961	0			
Support and Management		201	314	267			
Test and Evaluation		0	1501	760			
Total		2516	6776	1027			
B. Budget Acquisition History and Planning Information							
Performing Organizations							
Contractor or	Contract						
Government	Method/Type	Award or	Performing	Total			
Performance	or Funding	Obligation	Activity	Prior to			
Activity	Vehicle	Date	EAC	FY 1999	FY 2000	FY 2001	Budget to
							Complete
							Program
Product Development Organizations							
TACOM	MIPR			10578	2315	4961	0
Support and Management Organizations							
TACOM	MIPR			2779	112	194	172
MKI	RCP			502	0	0	0
MCSC	WR			282	49	120	95
CLNC	RCP			0	40	0	0
Test and Evaluation Organizations							
TACOM	MIPR			5198	0	0	760
MCOTEA	WR			0	0	1501	0
Government Furnished Property							
Contract							
Item	Method/Type	Award or		Total			
Description	or Funding	Obligation	Delivery	Prior to			
	Vehicle	Date	Date	FY 1999	FY 2000	FY 2001	Budget to
							Complete
							Program
Product Development Property							
Support and Management Property							
Budget Item Justification							
R-1 Line Item 177							

R-1 Line Item 177

Budget Item Justification

(Exhibit R-3, Page 5 of 18)

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## UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)				DATE	February 2000	PROJECT
BUDGET ACTIVITY		PE NUMBER AND TITLE		C0076		
7 - Operational System Development		0206624M Marine Corps Combat Services Support		C0076		
Test and Evaluation Property						
		Total				
		Prior to			Budget to	Total
		FY 1999	FY 1999	FY 2000	Complete	Program
		10578	2315	4961		17854
	Subtotal Product Development	3563	201	314	267	4612
	Subtotal Support and Management	5198		1501	760	9221
	Subtotal Test and Evaluation	19339	2516	6776	1762	9221
	Total Project				2029	31687

R-1 Line Item 177

Budget Item Justification

R-1 Line Item 177

Budget Item Justification

(Exhibit R-3, Page 6 of 18)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE February 2000	
BUDGET ACTIVITY		PE NUMBER AND TITLE								PROJECT	
7 - Operational System Development		0206624M Marine Corps Combat Services Support								C0201	
	COST (in Millions)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost	
C0201	Logistical Vehicle System Replacement (LVSR)	1873	1049	1064	12888	4711	1096	2	0	22883	
Quantity of RDT&E Articles											
<p><b>A. (U) Mission Description and Budget Item Justification:</b> The LVSR is the Marine Corps heavy tactical logistics distribution system. This system is comprised of a heavy tactical vehicle and flatrack modules that allow the LVSR to fulfill a variety of missions. The LVSR provides the system to throughput bulk liquids, ammunition, standardized containers, bridging equipment, heavy equipment, bulk/breakbulk cargo, as well as vehicle wrecker/ recovery missions. The LVSR will be fielded to elements of the Marine Air Ground Task Force (MAGTF), (Force Service Support Group (FSSG), Division, Wing) as the primary logistics throughput in supporting both Operational Maneuvers From the Sea (OMFTS) and Sustain Operations Ashore (SOA). The LVSR will be externally transportable by heavy vertical lift, or can arrive in zone via landing craft or causeway. The LVSR will provide organic and supporting heavy logistics transport capability. The LVSR will be the primary means of transporting bulk liquids, ammunition, containers, flatracks, bridging, bulk, breakbulk, and palletized cargo, and semitrailers.</p> <p><b>(U) FY 1999 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 600 Performed fabrication on LVSR technology demonstrator.</li> <li>• (U) \$ 373 Provided program management, travel, analysis of alternatives/technology studies in support for LVSR program.</li> <li>• (U) \$ 650 Performed LVS computer modeling and simulation.</li> <li>• (U) \$ 250 Developed brake modification.</li> <li>(U)Total \$ 1873</li> </ul> <p><b>(U) FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 501 Provide program management, travel, continue analysis of alternatives/technology studies in support for LVSR program.</li> <li>• (U) \$ 548 Initiate and complete test and evaluation on technology demonstrator.</li> <li>(U)Total \$ 1,049</li> </ul> <p><b>(U) FY 2001 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• (U) \$ 1064 Provide program management and travel in support of LVSR program.</li> <li>(U)Total \$ 1,064</li> </ul>											

R-1 Line Item 177

Budget Item Justification

(Exhibit R-2, Page 7 of 18)

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## UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000																																																								
BUDGET ACTIVITY		PE NUMBER AND TITLE	PROJECT																																																								
7 - Operational System Development		0206624M Marine Corps Combat Services Support	C0201																																																								
<p><b>B. (U) Project Change Summary</b></p> <table border="1"> <thead> <tr> <th></th> <th>FY 1999</th> <th>FY 2000</th> <th>FY2001</th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget</td> <td>883</td> <td>1055</td> <td>1075</td> </tr> <tr> <td>(U) Adjustments to Previous President's Budget</td> <td>+990</td> <td>-6</td> <td>-11</td> </tr> <tr> <td>(U) Current Budget Submit</td> <td>1873</td> <td>1049</td> <td>1064</td> </tr> </tbody> </table> <p>(U) Change Summary Explanation:</p> <p>(U) Funding: FY99 increase of \$990K reflects an increase of \$1010K due to reprioritization of programs within Marine Corps, a \$16K decrease for the SBIR tax assessment, and \$4K decrease for minor affordability adjustment. FY 00 decrease reflects a \$6K for minor affordability adjustment. FY01 decrease reflects an increase of \$1K for NW/CF rates adjustment and a decrease of \$12K for minor affordability adjustment..</p> <p>(U) Schedule: N/A</p> <p>(U) Technical: N/A</p> <p><b>C. (U) Other Program Funding Summary</b> (APPN, BLI #, NOMEN)</p> <table border="1"> <thead> <tr> <th></th> <th>FY 1999</th> <th>FY 2000</th> <th>FY 2001</th> <th>FY 2002</th> <th>FY 2003</th> <th>FY 2004</th> <th>FY 2005</th> <th>To Compl</th> <th>Total Cost</th> </tr> </thead> <tbody> <tr> <td>(U) PMC Line (BLI #509300) LVSR</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>59296</td> <td>88497</td> <td>CONT.</td> <td>CONT.</td> </tr> <tr> <td>(U) Related RDT&amp;E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) PE 0206623M Marine Corps Ground Combat Supporting Arms Systems</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					FY 1999	FY 2000	FY2001	(U) Previous President's Budget	883	1055	1075	(U) Adjustments to Previous President's Budget	+990	-6	-11	(U) Current Budget Submit	1873	1049	1064		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost	(U) PMC Line (BLI #509300) LVSR	0	0	0	0	0	59296	88497	CONT.	CONT.	(U) Related RDT&E										(U) PE 0206623M Marine Corps Ground Combat Supporting Arms Systems									
	FY 1999	FY 2000	FY2001																																																								
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R-1 Line Item 177		Budget Item Justification																																																									

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# RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

February 2000

BUDGET ACTIVITY

PE NUMBER AND TITLE

PROJECT

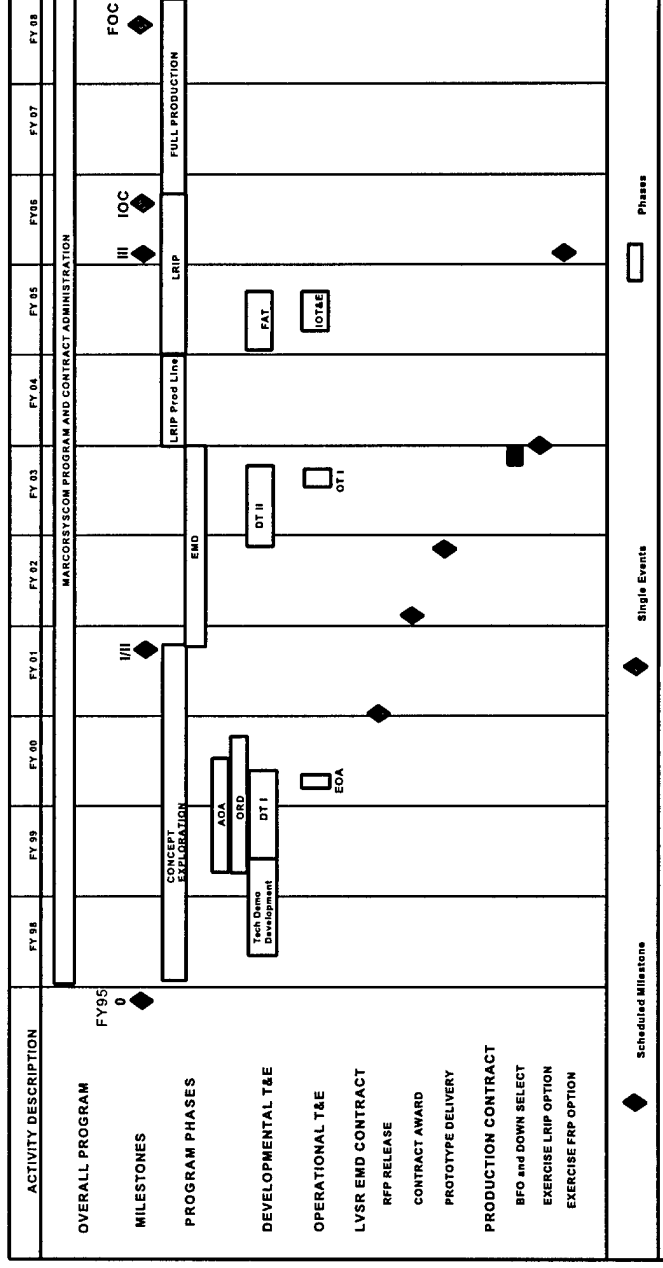
7 - Operational System Development

0206624M Marine Corps Combat Services Support

C0201

D. (U) Schedule Profile:

## Logistics Vehicle System Replacement (LVSr)



R-1 Line Item 177

Budget Item Justification

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										
BUDGET ACTIVITY					DATE		PROJECT			
7 - Operational System Development					February 2000		C0201			
PE NUMBER AND TITLE					0206624M Marine Corps Combat Services Support					
<b>A. (U) Project Cost Breakdown</b>										
Product Development	FY 1999	FY 2000	FY 2001							
	1444	0	0							
Support and Management	429	501	855							
Test	0	548	209							
Total	1873	1049	1064							
<b>B. Budget Acquisition History and Planning Information</b>										
<b>Performing Organizations</b>										
Contractor or Government	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity	Project Office	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Activity										
<b>Product Development Organizations</b>										
NSWC	WR				0	0	0	0	CONT	CONT
<b>Support and Management Organizations</b>										
MCCDC	WR				0	170	155	5	CONT	CONT
MCSC	WR				0	62	141	854	CONT	CONT
MCSC	RCP				0	184	150	200	CONT	CONT
TACOM	MIPR				0	0	0	0	CONT	CONT
NSWC	WR				0	0	50	0	CONT	CONT
NSWC	RCP				0	1444	0	0	CONT	CONT
MCLB, Albany	WR					13	5	5	CONT	CONT
<b>Test and Evaluation Organizations</b>										
NSWC	RCP				0	0	548	0	CONT	CONT
VARIOUS					0	0	0	0	CONT	CONT
<b>Government Furnished Property</b>										
Contract	Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program	
Item Description										
<b>Product Development Property</b>										

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Budget Item Justification

## February 2000

PE NUMBER AND TITLE

PE NUMBER AND TITLE  
0206624M Marine Corps Combat Services Support

**PROJECT  
C0201**

## Test and Evaluation Property

Budget to	Total
<u>Complete</u>	<u>Program</u>
CONT	CONT
CONT	CONT
CONT	CONT
CONT	CONT

Subtotal Product Development  
Subtotal Support and Management  
Subtotal Test and Evaluation  
Total Project

<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
1873	501	1064
1873	548	1064
1873	1049	1064

Total	
<u>Program</u>	
CONT	
CONT	
CONT	
CONT	

### Budget Item Justification

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## RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

February 2000

BUDGET ACTIVITY

## 7 - Operational System Development

PE NUMBER AND TITLE

0206624M Marine Corps Combat Services Support

PROJECT

C2316

COST (In Millions)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
C2316 Combat Services Support Engineering Equipment	1146	267	515	138	159	0	0	0	2952
Quantity of RDT&E Articles									

**A. (U) Mission Description and Budget Item Justification:** This project includes improvements in all areas of Combat Service Support Equipment. The Army developed Combat Breacher Vehicle will be a fully tracked, armored vehicle capable of keeping pace with the maneuver force. It will breach minefields with a full width mine plow, equipped with automatic depth control while maintaining speeds of 4 to 5 miles per hours. The CBV, is a fully tracked, heavy protection level combat system being developed by the Army to enhance the combat breaching capabilities of the ground combat elements. The overall system is integrated on the M1 chassis to provide commonality with the tank fleet while providing the latest technology in direct fire armor protection. It will provide capabilities to breach minefields, neutralize obstacles, demolish berms and fill in auto tank ditches. Major subsystems of the CBV include an automatic depth control system, a weapon systems station, a commander's control station and a power driven arm. The Pentagon has approved a large-scale reshaping of the Army's budget for FY01 to reflect the new vision for the service, including a major restructuring of United Defense, L.P.'s Crusader self-propelled howitzer program, the standing up of two medium brigades at Ft. Lewis, Washington, and procurement of new medium and light armored vehicles to equip them, and the acceleration and termination of several other programs including the CBV program. The 1500 Reverse Osmosis Water Purification Unit (1500ROWPU) is capable of providing potable water from any available raw water source. The 1500ROWPU is "state-of-the-art" technology producing 1,200/1,500 gallons per hour (GPH). This system will replace the aging 600 GPH ROWPUs at a 2 old systems to 1 enhanced system ratio. The 1500ROWPU will reduce logistics, maintenance, and transportation requirements allowing significant potential cost avoidance in out year support costs. The 1500ROWPU is a joint Marine Corps program with the Army as the lead service. The current Twin Agent Unit (TAU) firefighting apparatus is mounted on a modified Commercial Utility, Cargo Vehicle (CUCV). The CUCV has reached the end of its designed service life and was phased out of the Marine Corps' inventory by FY 1997. Funds will be used to determine the reconfiguration of the current TAU and the Truck, Utility, Cargo, D1180, into a compatible mobile extinguisher. The Third Echelon Test Set (TETS) is a portable, highly mobile general purpose automatic tester designed for use by technicians both in garrison and at the forward edge of the battlefield.

## (U) PROGRAM ACCOMPLISHMENTS AND PLAN

## (U) FY 1999 Accomplishments:

- (U) \$ 701 1500 ROWPU: Provided prototype changes to componentry to optimize the design hardware.
- (U) \$ 159 CBV: Develop deep water fording kit. Conduct shipboard compatibility study.
- (U) \$ 30 TAU: Purchased prototype for testing.
- (U) \$ 141 TAU: Completed DT.
- (U) \$ 10 TAU: Provided travel in support of TAU.
- (U) \$ 105 TETS: Developed baselines for virtual automatic testing in support of emerging weapon systems.
- (U) Total \$ 1,146

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Budget Item Justification

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE	February 2000																																																								
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT																																																									
<b>7 - Operational System Development</b>	<b>0206624M Marine Corps Combat Services Support</b>	<b>C2316</b>																																																									
<p>(U) <b>FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>(U) \$ 164 CBV: Integrate full width mine plow and remote kit to AAV and M1A1 chassis.</li> <li>(U) \$ 103 TETS: Continue development of new technology testing applications in support of emerging weapon systems.</li> <li>(U) Total \$ 267</li> </ul> <p>(U) <b>FY 2001 Planned Program:</b></p> <ul style="list-style-type: none"> <li>(U) \$ 406 1500 ROWPU: Test and evaluate ancillary equipment to include membrane cleaning and preservation system and ocean intake structures.</li> <li>(U) \$ 109 TETS: Continue development of new technology testing applications in support of emerging weapon systems.</li> <li>(U) Total \$ 515</li> </ul> <p><b>B. (U) Project Change Summary</b></p> <table border="1"> <thead> <tr> <th></th> <th>FY 1999</th> <th>FY 2000</th> <th>FY 2001</th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget</td> <td>836</td> <td>1702</td> <td>1581</td> </tr> <tr> <td>(U) Adjustments to Previous President's Budget</td> <td>+310</td> <td>-1435</td> <td>-1066</td> </tr> <tr> <td>(U) Current Budget Submit</td> <td>1146</td> <td>267</td> <td>515</td> </tr> </tbody> </table> <p>(U) Change Summary Explanation:</p> <p>(U) Funding: FY99 increase of \$310K reflects an increase of \$340K due to reprioritization of programs within the Marine Corps, a decrease of \$22K for the SBIR tax assessment, and a NAVCOMPT adjustment decrease \$8K. FY00 decrease of \$1,435 due to 1,417K internal reprogramming of CBV deep fording kit and automatic blade deployment development efforts and 18K tax assessment. FY01 decrease of 1,066K reflects a decrease of 1,053K due to internal reprogramming of CBV deep fording kit and automatic blade deployment development efforts and 13K tax assessment.</p> <p>(U) Schedule:</p> <p>(U) Technical:</p> <p><b>C. (U) Other Program Funding Summary</b> (APPN, BLI #, NOMEN)</p> <table border="1"> <thead> <tr> <th></th> <th>FY 1999</th> <th>FY 2000</th> <th>FY 2001</th> <th>FY 2002</th> <th>FY 2003</th> <th>FY 2004</th> <th>FY 2005</th> <th>To Compl</th> <th>Total Cost</th> </tr> </thead> <tbody> <tr> <td>(U) PMC Line (BLI# 627400) 1500ROWPU</td> <td>0</td> <td>0</td> <td>0</td> <td>7744</td> <td>13053</td> <td>16570</td> <td>8198</td> <td>Cont</td> <td>Cont</td> </tr> <tr> <td>(U) PMC Line (BLI# 666900) CAFMS</td> <td>1137</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1137</td> </tr> <tr> <td>(U) PMC Line (BLI# 440200) TETS</td> <td>29245</td> <td>28862</td> <td>4714</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>62821</td> </tr> </tbody> </table> <p>R-1 Line Item 177</p> <p>Budget Item Justification</p>					FY 1999	FY 2000	FY 2001	(U) Previous President's Budget	836	1702	1581	(U) Adjustments to Previous President's Budget	+310	-1435	-1066	(U) Current Budget Submit	1146	267	515		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost	(U) PMC Line (BLI# 627400) 1500ROWPU	0	0	0	7744	13053	16570	8198	Cont	Cont	(U) PMC Line (BLI# 666900) CAFMS	1137	0	0	0	0	0	0	0	1137	(U) PMC Line (BLI# 440200) TETS	29245	28862	4714	0	0	0	0	0	62821
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(Exhibit R-2, Page 13 of 18)

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE									PROJECT
<b>7 - Operational System Development</b>		<b>0206624M Marine Corps Combat Services Support</b>									<b>C2316</b>
C. (U) Other Program Funding Summary		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To	Compl	Total
(APPN, BLI #, NOMEN)											
(U) PMC Line (BLI# 667000) ILT \$5 (CAFSM)		0	3419	0	0	0	0	0	0	0	3419
(U) Related RDT&E											
(U) PE 0206623M Marine Corps Ground Combat Supporting Arms Systems											
(U) PE 0603640M Marine Corps Advanced Technology Demonstration											
(U) PE 0604804A Logistics and Engineering Equip/Engr Development											
(U) PE 0206313M Marine Corps Communications											
D. (U) Schedule Profile: Not Applicable											

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Budget Item Justification

(Exhibit R-2, Page 14 of 18)

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										
BUDGET ACTIVITY					DATE		PROJECT			
7 - Operational System Development					0206624M Marine Corps Combat Services Support		February 2000 C2316			
A. (U) Project Cost Breakdown										
Production Development					FY 1999	FY 2000	FY 2001			
					849	164	406			
Support and Management					124	103	109			
Test and Evaluation					173	0	0			
Total					1146	267	515			
B. Budget Acquisition History and Planning Information										
Performing Organizations										
Contractor or		Contract								
Government		Method/Type		Award or		Performing				
Performing		or Funding		Obligation		Activity				
Activity		Vehicle		Date		EAC				
Product Development Organizations										
Miscellaneous		Various				Total				
TACOM		MIPR				FY 1999		FY 2000		
						FY 1999		FY 2001		
						FY 1999		FY 2000		
						FY 1999		FY 2001		
						FY 1999		FY 2000		
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						FY 1999		FY 2000		
						FY 1999		FY 2001		
						FY 1999				

## RDT&amp;E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

February 2000

PE NUMBER AND TITLE

## Marine Corps Combat Services Support

**C2316**

	Total Prior to FY 1999	FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Subtotal Product Development	796	849	164	406	166	2381
Subtotal Support and Management	415	124	103	109	131	882
Subtotal Test and Evaluation	595	173				768
Total Project	1806	1146	267	515	297	4031

### Budget Item Justification

(Exhibit R-3, Page 16 of 18)

**UNCLASSIFIED**

## UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)										DATE	February 2000
BUDGET ACTIVITY		PE NUMBER AND TITLE								PROJECT	
7 - Operational System Development		0206624M Marine Corps Combat Services Support								C2509	
COST (In Millions)		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost	
C2509 Motor Transport Modification		0	245	248	252	258	263	268	Continuing	Continuing	
Quantity of RDT&E Articles											

(U) **Mission Description and Budget Item Justification:** This project develops joint service and Marine Corps unique improvements to motor transport systems, monitors the commercial automotive industrial base for technology insertions to increase Reliability Availability and Maintainability, Durability (RAM-D), reduce ownership costs, and resolve unplanned safety hazards. This also includes the monitoring and implementation of state and federal requirements if required. This will be a "level of effort" program to quickly analyze and field items that address safety modifications and product improvements to current systems that increase combat readiness and capability. Funding will focus on streamlined acquisitions of Commercial-Off-the-Shelf/Non-Developmental Item (COTS/NDI) items that can be identified, integrated, and tested in a short amount of time. Successful modifications will be later procured and fielded to the Fleet Marine Force (FMF).

(U) **PROGRAM ACCOMPLISHMENTS:**

A. (U) Mission Description and Budget Item Justification:

(U) **FY 1999 Accomplishments: Not Applicable.**

(U) **FY 2000 Planned Program:**

- (U) \$ 38 Program Management and travel in support of Motor Transport modifications.
- (U) \$ 108 Develop kits for Motor Transport modifications utilizing COTS/NDI.
- (U) \$ 99 Begin testing, integration and evaluation on Motor Transport modifications which utilize COTS/NDI.
- (U) Total \$ 245

(U) **FY 2001 Planned Program:**

- (U) \$ 35 Program Management and travel in support of Motor Transport modifications.
- (U) \$ 112 Develop kits for Motor Transport modifications utilizing COTS/NDI.
- (U) \$ 101 Begin testing, integration and evaluation on Motor Transport modifications which utilize COTS/NDI.
- (U) Total \$ 248

R-1 Line Item 177

Budget Item Justification

## RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

February 2000

PE NUMBER AND TITLE

## Marine Corps Combat Services Support

**C2509**

FY 2001

246

251

1

-3

245

248

(U) Funding: FY00 reduction of \$1K is due to minor affordability adjustments. FY01 reduction of \$3K is due to minor affordability adjustments.

(U) Technical:

Total

Cost

**D. (U) Schedule Profile: Not Applicable.**

### Budget Item Justification

**UNCLASSIFIED**

**UNCLASSIFIED**

**EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0207161N**

**PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT**

**(U) COST: (Dollars in Thousands)**

<u>Project Number &amp; Title</u>	<u>FY 1999 Budget</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
E0457 AIM-9X	57,066	39,830	21,705	13,885	1,859	693	1,334	0	264,632
<b>TOTAL</b>	57,066	39,830	21,705	13,885	1,859	693	1,334	0	264,632

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The AIM-9X Sidewinder program is a joint USN/USAF effort to continue the evolutionary development of the AIM-9 missile. The AIM-9X is the long-term evolution of the AIM-9 that will provide a series of modifications to the AIM-9 improving seeker/guidance and kinematic performance and will be fielded in the post-2000 timeframe. Funding for AIM-9X activities beyond FY 1994 is provided equally by the USN and USAF in total. The test articles are developmental assets for proving missile performance in support of the Low Rate Initial production (LRIP) Defense Acquisition Board (DAB) and MS III decisions, and are delivered in the indicated fiscal years.

As of January 2000, the program has already demonstrated capabilities (through a combination of captive carry flights 7 separation control test flights and 3 guided live fire shots) beyond those of the current US fielded AIM-9M short range missiles. Joint USN and USAF warfighters have emphasized the need to aggressively field the AIM-9X capability to counter the already fielded and superior enemy air-to-air capabilities.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

**R-1 ITEM NO. 178**

**UNCLASSIFIED**



**UNCLASSIFIED**

**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET      DATE: February 2000**

**BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0207161N      PROJECT NUMBER: E0457**  
**PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT      PROJECT TITLE: AIM-9X**

**(U) COST: (Dollars in Thousands)**

<b>PROJECT NUMBER &amp; TITLE</b>	<b>FY 1999</b>	<b>FY 2000</b>	<b>FY 2001</b>	<b>FY 2002</b>	<b>FY 2003</b>	<b>FY 2004</b>	<b>FY 2005</b>	<b>TO</b>	<b>TOTAL</b>
	<b>BUDGET ESTIMATE</b>	<b>BUDGET ESTIMATE</b>	<b>BUDGET ESTIMATE</b>	<b>BUDGET ESTIMATE</b>	<b>BUDGET ESTIMATE</b>	<b>BUDGET ESTIMATE</b>	<b>BUDGET ESTIMATE</b>	<b>COMPLETE</b>	<b>PROGRAM</b>
E0457 AIM-9X	57,066	39,830	21,705	13,885	1,859	693	1,334	0	264,632
RDT&E,N Articles	1	6	8	11					26

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The AIM-9X Sidewinder program is a joint USN/USAF effort to continue the evolutionary development of the AIM-9 missile. The AIM-9X is the long term evolution of the AIM-9 that will provide a series of modifications to the AIM-9 improving seeker/guidance and kinematic performance which will be fielded in the post-2000 timeframe. Funding for AIM-9X activities beyond FY 1994 is provided equally by the USN and USAF in total. The test articles are developmental assets for proving missile performance in support of the LRIP DAB and MS III decisions, and are delivered in the indicated fiscal years.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

**1. FY 1999 ACCOMPLISHMENTS: (Navy Share Only)**

- (U) (\$27,300) Continued EMD efforts.
- (U) (\$9,110) Continued providing aircraft interface support to the EMD contractor. Aircraft interface verified through captive aircraft OFP flights, hardware interface and conducting initial separation guided tests. Incorporated the results of wind tunnel test for missile/platform interface and compatibility efforts.
- (U) (\$15,969) Continued EMD contractor monitoring, continuing DT-IIB, started DT-IIC (Guided Launches), Operational Test-IIA (OT-IIA) Captive Carry Flights, and provided consulting services support.

**R-1 ITEM NO. 178**

**UNCLASSIFIED**

**UNCLASSIFIED**

**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET      DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0207161N  
PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT**

**PROJECT NUMBER: E0457  
PROJECT TITLE: AIM-9X**

- (U) (\$1,917) Headquarters/field travel performed.
- (U) (\$2,770) Continued digital upgrade to LAU-7 launcher.

**2. FY 2000 PLAN: (Navy Share Only)**

- (U) (\$19,635) Continue EMD efforts.
- (U) (\$1,320) Continue to provide aircraft interface support to the EMD contractor in support of OT-IIA, DT-IIC/DT-IID (Launches) and complete OT-IIA and delivery of Production Representative Test Articles.
- (U) (\$13,292) Continue providing Government flight test support through implementation of DT-IIC/OT-IIA and Captive Carry Reliability Flight Program and Government engineering support to the EMD activities.
- (U) (\$5,387) Provide for consulting services, technical engineering, and management support.
- (U) (\$196) Headquarters travel.

**3. FY 2001 PLAN: (Navy Share Only)**

- (U) (\$10,095) Continue EMD efforts to include completion of DT-IIC and start of DT-IID (TECHEVAL).
- (U) (\$7,660) Continue providing government flight test support through implementation of DT-IID and DT assist with operational testers.
- (U) (\$3,822) Provide for consulting services, technical engineering, and management support.
- (U) (\$128) Headquarters travel.

**R-1 ITEM NO. 178**

**UNCLASSIFIED**

UNCLASSIFIED

EXHIBIT R-2a, FY 2001 RDT&E N BUDGET PROJECT JUSTIFICATION SHEET DATE: February 2000  
 BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0207161N PROJECT NUMBER: E0457  
 PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT PROJECT TITLE: AIM-9X

(U) B. PROGRAM CHANGE SUMMARY:

(U) FY 2000 President's Budget:	FY 1999	FY 2000	FY2001
	64,626	40,051	17,503
(U) Appropriated Value:	65,855	40,051	
(U) Adjustments from PRESBUDG:	-7,560	-221	4,202
(U) FY 2001 President's Budget Submit:	57,066	39,830	21,705

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 reduction of \$7,560 thousand reflects a reduction of \$979 thousand for a SBIR assessment, a reduction of \$1,000 thousand for a Below Threshold reprogramming (BTR) for emergent requirements, a reduction of \$2,200 thousand for a BTR for Integrated Defensive Electronic Countermeasures (IDECM), a reduction of \$2,607 thousand for a BTR for High Order of Language (HOL), a reduction of \$309 thousand for inflation savings, a reduction of \$439 thousand for higher Navy priorities and a reduction of \$26 thousand for payment of lapsed liability contracts. The FY 2000 decrease reflects a \$221 thousand reduction for an Across-the-Board rescission. The FY 2001 net increase of \$4,202 thousand reflects an increase of \$4,597 thousand in the testing and contractor (Raytheon) efforts due to delays in flight test efforts attributable to a nine month delay of the Separation Control Test Vehicles (SCTV) and a four month delay of Engineering Development Model (EDM) launches as well as a net decrease of \$237 thousand due to Strategic Sourcing Plan savings and Navy Working Capital Fund (NWCFF) adjustments, a increase of \$51 thousand for Military and Civilian Pay, a \$152 thousand decrease for revised economic assumptions and a \$57 thousand decrease for reprioritization of requirements within the Navy. The SCTV and EDM delays were caused by technical issues with the Control Actuation System (CAS) and the tracker's software problems.

(U) Schedule: Test article delivery schedule revised to reflect EMD schedule changes created by SCTV and EDM launch delays. The Test and Evaluation milestones of conducting Insensitive Munitions Test shifted from the 2<sup>nd</sup> Qtr of FY99 to the 4th Qtr FY99 and OT-IIB (OPEVAL) start shifted from the 3<sup>rd</sup> Qtr FY01 to the 1st Qtr FY02.

(U) Technical: Not applicable.

R-1 ITEM NO. 178

UNCLASSIFIED

**UNCLASSIFIED**

**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET      DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0207161N**

**PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT**

**PROJECT NUMBER: E0457**  
**PROJECT TITLE: AIM-9X**

(U) C. OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands):

APPN	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO COMPLETE
Qty	0	63	157	283	298	291	3908
WPN-Mod	0	27,532	42,816	60,945	62,179	64,455	861,705
-Spares		759	1,042	1,051	895	989	

(U) RELATED RDT&E:

(U) DA PE 0603715D (AIM-9 CONSOLIDATED PROGRAM)

(U) AF PE 0207161F (TACTICAL AIM MISSILE)

(U) D. ACQUISITION STRATEGY: The Acquisition Decision Memorandum (ADM) dated December 3, 1996 approved program entry into Engineering and Manufacturing Development (E&MD). A contract with Hughes Missile Systems Company for E&MD was awarded December 13, 1996. Retrofitting of components will extend the operational effectiveness of existing inventories at an affordable cost while continuing evolution of the AIM-9 series. The E&MD contract is a Cost Plus Incentive Fee/Award Fee. In December 1997, Hughes Missile Systems Company became Raytheon Missile Systems Company as a result of Raytheon's acquisition of Hughes. The EMD contract includes three Fixed Price Incentive Fee options for production, Low Rate Initial Production (LRIP) Lots 1, 2, and 3. These production options are planned to be exercised in FY01, FY02, and FY03. This reflects the FY00 Appropriations Act deferral of LRIP I funding.

**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET      DATE: February 2000**

R-1 ITEM NO. 178

**UNCLASSIFIED**

UNCLASSIFIED

BUDGET ACTIVITY: 7  
PROGRAM ELEMENT: 0207161N  
PROGRAM ELEMENT TITLE: TACTICAL AIR INTERCEPT  
PROJECT NUMBER: E0457  
PROJECT TITLE: AIM-9X

(U) E. SCHEDULE PROFILE:

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>TO COMPLETE</u>
(U)Program Milestones		4Q/00 LRIP I DAB		3Q/03 MSIII*
(U)Engineering Milestones			1Q/01 TRR TECHEVAL	1Q/02 TRR for OPEVAL
(U)T&E Milestones	4Q/99-3Q/00 OT-IIA		2Q/01-4Q/01 DT-IID	1Q/02-1Q/03* OT-IIB
(U)Contract Milestones			1Q/01 LRIP I	1Q/02 LRIP II

\* APB update approved in September 1999, a revision reflecting the deferral of FY00 procurement funding is in staffing within DOD. Deferral of the FY00 procurement funding is reflected in the MSIII and IOC/RAA dates.

# UNCLASSIFIED

## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: Feb 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207161N

PROJECT NUMBER: E0457  
PROJECT TITLE: AIM-9X

<u>Cost Categories:</u>	Contract Method	Performing Activity & Location	*Total Prior Yrs	FY 1999		FY 2000		FY 2001		FY 2001 Award Date	FY 2001 Award Date	Total Cost	**Target Value of Contract
				Cost	Date	Cost	Date	Complete	Cost				
DEM/VAL	C/CPIF	Hughes Tucson AZ	6,685	0		0		0	6,685			22,600	
	C/CPIF	Raytheon Bedford MA	8,587	0		0		0	8,587			24,900	
EMD	C/CPIF/AF	Hughes Tucson, AZ	56,509	23,744	OCT 98	16,313	OCT 99	8,557	8,518	OCT 00		113,641	197,500
EMD Award Fee Aircraft Integration	C/CPFF	Boeing St. Louis, Mo	5,250	3,556	JUL 99	3,322	AUG 00	1,538	230	NOV 01		13,896	13,896
			13,967	9,110	OCT 98	1,320	OCT 99	234	24,631				
Engineering Services	WX	NAWCWD	26,237***	3,337	NOV 98	2,070	NOV 99	1,234	823	NOV 00		33,701***	
	WX	NAWCAD		1,022	NOV 98	1,615	NOV 99	1,225	578	NOV 00		4,440	
Miscellaneous I/H (Efforts <\$1.0M)	Various	Various	4,780	1,661	NOV 98	705	NOV 99	955	1,759	NOV 00		9,860	
LAU-7 Launcher	C/CPFF	Boeing St. Louis, Mo.	1,782	2,770	NOV 98							4,552	
Contract (P <sup>3</sup> I)	TBD	TBD											
Subtotal Product Development			123,797	45,200		25,345		13,509	14,514			222,365	2,372
Support Costs included in Management													
Subtotal Support			0	0		0		0	0			0	0

### Remarks:

Award Fee is 12% of the Target Cost and is broken into four increments (this will change as the contract value is revised). The first award fee period was applied in July 1998; the second was applied in Aug 1999. \*FY95 and prior funded under P.E. 0603715D. FY96 and out are funded under P.E. 0207161N. \*\*Target Value includes both Navy and Air Force Funding. \*\*\*Prior Years include NAWCWD/NAWCAD.

R-1 ITEM NO. 178

# UNCLASSIFIED

Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, Page 7 of 8)

# UNCLASSIFIED

## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: Feb 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207161N

PROJECT NUMBER: E0457  
PROJECT TITLE: AIM-9X

<u>Cost Categories:</u>	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date		
Test & Evaluation	WX NAWCWD		*	6,499	Nov 98	12,013	Nov 99	7,818	Nov 00	2,718	29,048
	WX NAWCAD			3,183	Nov 98	1,500	Nov 99	0		179	4,862

### Subtotal Test & Evaluation

\* 9,682 13,513 7,818 2,897 33,069

### Remarks:

Contract Engineering Support	ID/IQ, T&M	Endmark Arlington, VA	2,750	1,402	Dec 98	0	0	0	0	4,152	4,152
Program Management Support Various Eng. Support Contracts Travel	TBD	TBD									
	ID/IQ, T&M	NSM	1,088	320	Dec 98	776	Dec 99	250	Dec 00	270	1,296
	ID/IQ, T&M	Various		206	Dec 98						1,408
	WX	PMA 259 IPT	625	256	Oct 98	196	Oct 99	128	Oct 00	90	206
Subtotal Management			4,463	2,184		972		378		360	8,357

### Remarks:

### Total Cost

\*T&E Costs - prior years included in product development 128,260 57,066 39,830 21,705 17,771 264,632

R-1 ITEM NO. 178

# UNCLASSIFIED

**UNCLASSIFIED**  
**EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0207163N**  
**PROGRAM ELEMENT TITLE: AMRAAM**

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999</u> <u>Actual</u>	<u>FY 2000</u> <u>Budget</u>	<u>FY 2001</u> <u>Estimate</u>	<u>FY 2002</u> <u>Estimate</u>	<u>FY 2003</u> <u>Estimate</u>	<u>FY 2004</u> <u>Estimate</u>	<u>FY 2005</u> <u>Estimate</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
E0981 AMRAAM	4,521	13,469	12,140	10,831	8,217	9,632	9,919	Cont.	Cont.
<b>TOTAL</b>	4,521	13,469	12,140	10,831	8,217	9,632	9,919	Cont.	Cont.
Quantity of RDT&E Articles									

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This joint Navy/Air Force program is structured in response to the Joint Service Operational Requirement and Mission Element Need Statement to develop an air superiority air-to-air missile with significant improvements in operational utility and combat effectiveness. This program supports the integration of the AMRAAM into Navy aircraft with analysis of Navy unique applications, simulation capability development, aircraft missile integration tasks, pre-planned product improvement (P3I) efforts, and procurement of hardware to support Navy test and evaluation tasks. This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

**R-1 Item No. 179**  
**UNCLASSIFIED**



**UNCLASSIFIED**  
**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

DATE: February 2000

PROJECT NUMBER: E0981  
 PROJECT TITLE: AMRAAM

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0207163N  
 PROGRAM ELEMENT TITLE: AMRAAM

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
	<u>Actual</u>	<u>Budget</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	<u>Program</u>
<b>TOTAL</b>	4,521	13,469	12,140	10,831	8,217	9,632	9,919	Cont.	Cont.
Quantity of RDT&E Articles									

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This joint Navy/Air Force program is structured in response to the Joint Service Operational Requirement and Mission Element Need Statement to develop an air superiority air-to-air missile with significant improvements in operational utility and combat effectiveness. This program supports the integration of the AMRAAM into Navy aircraft with analysis of Navy unique applications, simulation capability development, aircraft missile integration tasks, pre-planned product improvement (P3I) efforts, and procurement of hardware to support Navy test and evaluation tasks.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 ACCOMPLISHMENTS:
  - (U) (\$4,521) Initiated systems engineering and participated in AMRAAM P3I Phase 3 EMD program (incorporating additional Air Force funding of \$33,466) with emphasis on Navy unique compatibility requirements and aircraft integration compatibility requirements. Conducted P3I Phase 3 System Design Review. Continued Joint Tactical Air-to-Air Missile Office (JTAAMO) Air-to-Air Roadmap activities.

**R-1 Item No. 179**  
**UNCLASSIFIED**

**UNCLASSIFIED**  
**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE:** February 2000

**BUDGET ACTIVITY:** 7      **PROGRAM ELEMENT:** 0207163N  
**PROGRAM ELEMENT TITLE:** AMRAAM

**PROJECT NUMBER:** E0981  
**PROJECT TITLE:** AMRAAM

**2. FY 2000 PLAN:**

- (U) (\$13,469) Continue systems engineering/aircraft integration activities in AMRAAM P3I Phase 3 EMD program (incorporating additional Air Force funding of \$52,146) conducting proof of design (POD) testing of Phase 3 components with emphasis on Navy unique compatibility requirements and aircraft integration compatibility requirements. Conduct Phase 3 Preliminary Design Reviews. Continue JTAAMO Air-to-Air Roadmap activities including technology studies.

**3. FY 2001 PLAN:**

- (U) (\$12,140) Continue systems engineering/aircraft integration activities in AMRAAM P3I Phase 3 EMD program (incorporating additional Air Force funding of \$53,707) conducting proof of design (POD) testing of Phase 3 components with emphasis on Navy unique compatibility requirements and aircraft integration compatibility requirements. Develop, code, and test P3I Phase 3 software. Begin integration of hardware and software into missile test articles for use in ground testing. Conduct Phase 3 Critical Design Review.

**R-1 Item No. 179**  
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**UNCLASSIFIED**  
**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0207163N  
 PROGRAM ELEMENT TITLE: AMRAAM

PROJECT NUMBER: E0981  
 PROJECT TITLE: AMRAAM

(U) B. PROGRAM CHANGE SUMMARY

(U) FY2000 President's Budget:	<u>FY 1999</u> 4,674	<u>FY 2000</u> 13,544	<u>FY 2001</u> 12,311
(U) Appropriated Value:	4,862	13,544	
(U) Adjustments from President's Budget:	-153	-75	-171
(U) FY2001 President's Budget Submit:	4,521	13,469	12,140

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY1999 net decrease of \$153 thousand reflects a reduction of \$126 thousand for a SBIR assessment, a reduction of \$22 thousand for revised economic assumptions, and a reduction of \$5 thousand for minor adjustments. The FY2000 net decrease of \$75 thousand was for an across-the-board Congressional rescission. The FY2001 net decrease of \$171 thousand reflects a reduction of \$94 thousand for revised economic assumptions and a reduction of \$77 thousand for a reprioritization of requirements within the Navy.

(U) Schedule: None  
 (U) Technical: None.

(U) C. OTHER PROGRAM FUNDING SUMMARY

Appn WPN/P1#6	Qty	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
	\$	100	100	75	75	75	75	75	561
		50,839	46,073	38,943	45,830	45,724	43,749	44,692	253,646

Related RDT&E

- (U) PE 0207130F F-15
- (U) PE 0204136N F/A-18 Squadrons
- (U) PE 0207163F AMRAAM P31
- (U) PE 0207133F F-16
- (U) PE 0604239F F-22
- (U) PE 0207134F F-15E

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE:** February 2000

**BUDGET ACTIVITY:** 7      **PROGRAM ELEMENT:** 0207163N  
**PROGRAM ELEMENT TITLE:** AMRAAM

**PROJECT NUMBER:** E0981  
**PROJECT TITLE:** AMRAAM

(U) D. ACQUISITION STRATEGY: With the December 1997 merger of Raytheon and Hughes into the Raytheon Systems Company, the government implemented a new acquisition strategy labeled AMRAAM Vision 2000. The Vision 2000 strategy capitalizes on the hardware pricing agreement between Raytheon and the government under the auspices of the Department of Justice, and supported the Raytheon/Hughes merger and a shift in government business practices toward a more "commercial" business arrangement. The procurement lot 12 contract award includes an overarching price control strategy and the transfer of Total System Performance Responsibility (TSPR) to the Raytheon Defense Systems Segment in Tucson, Arizona. The purchase includes missiles, warranties, spares, missile performance tracking and assessments, and reliability tests. Raytheon assumes control and responsibility for all specifications below missile performance. Also included in this contract are pre-priced options for lots 13-15, awarded in FY99.

**(U) E. SCHEDULE PROFILE**

To Complete

FY 2001

FY 2000

FY 1999

1Q P3I-3  
EMD CTK AWD

(U) Program Milestones

(U) Engineering Milestones

3Q P3I-3 SDR

3Q P3I-3 PDR

4Q P3I-3 CDR

P3I FLT TEST

(U) T&E Milestones

(U) Contract Milestones

**R-1 Item No. 179**  
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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207163N

PROJECT NUMBER: E0981  
PROJECT TITLE: AMRAAM

DATE: February 2000

<u>Cost Categories:</u>	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date		
Product Development	SS/CPAF	AAC EGLIN AFB, FL		2066	1/99	9744	11/99	8217	11/00	24309	TBD
Award Fee		AAC EGLIN AFB, FL		369	1/99	1720	11/99	1457	11/00	4307	TBD
Product Development	WX	NAWC-WD Pt. Mugu, CA		50	11/98	50	11/99	50	11/00	206	TBD
Subtotal Product Development				2485		11514		9724		28822	Cont.

## Remarks:

Percentage of Award fees actually awarded in past award fee period is FY 99 for \$369K (15%)

Support	SS/CPAF	AAC EGLIN AFB, FL		48	1/99						
Support	SS/FFP	JHU/APL LAUREL MD		60	4/99	270	4/00	364	5/00	1526	Cont.
Support	RX	NSMA VA		1278	1/99	967	12/99	1030	12/00	3607	Cont.
Support	WX	NAWC-WD Pt. Mugu, CA		245	10/98	100	10/99	100	10/00	412	Cont.
Subtotal Support				1631		1337		1494		5545	Cont.

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Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, Page 6 of 7)

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0207163N

PROJECT NUMBER: E0981  
PROJECT TITLE: AMRAAM

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		Cost to Complete	Total Cost	Target Value of Contract
				Cost	Date	Cost	Date	Cost	Date			
Test and Evaluation	RX	NAWC-WD CHINA LAKE		150	1/99	154	10/99	250	10/00	1462	Cont.	TBD
Subtotal Test & Evaluation			150			154		250		1462	Cont.	
Remarks:												
	Management	PMA268 EGLIN AFB FL NAWC-WD CHINA LAKE		255		264	10/99	268	10/00	1114	Cont.	TBD
						200		404		1656	Cont.	TBD
Subtotal Management			255			464		672		2770	Cont.	
Remarks:												
Total Cost			4521			13469		12140		38599	Cont.	TBD

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**EXHIBIT R-2, FY2001 RDT&E,N BUDGET ITEM JUSTIFICATION**

**DATE: FEB 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0303109N**

**PROGRAM ELEMENT TITLE: Satellite Communications (Space)**

(U) Cost (\$ in Thousands)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
X0728 EHF SATCOM Terminals	15,668	8,447	9,323	10,570	10,693	11,852	8,071	CONT.	CONT.
X0731 Fleet Satellite Comm	1,816	2,814	1,480	1,012	0	0	0	CONT.	CONT.
X2472 Mobile User Segment	0	28,941	26,975	30,667	0	0	0	CONT	CONT
<b>Total PE Cost</b>	<b>17,484</b>	<b>40,202</b>	<b>37,778</b>	<b>42,249</b>	<b>10,693</b>	<b>11,852</b>	<b>8,071</b>	<b>0</b>	<b>CONT.</b>

**A. Mission Description and Budget Item Justification:**

**(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:**

(U) The Navy Extremely High Frequency (EHF) Satellite Communications (SATCOM) Program (NESP) provides for the development and production of terminals to provide anti-jam, low probability of intercept/detection communications capability for Command and Control of the fleet. NESP operates with FLTSAT EHF Packages (FEP) and Ultra High Frequency (UHF) Follow On (UFO) Satellite Packages and is the Navy's portion of Milstar I/II. The Milstar program is comprised of satellites, control stations, and aircraft, ship, and ground terminals to provide assured worldwide, secure, anti-jam, survivable communications for the National Command Authority, CINCs, and operational commanders. The Advanced EHF (AEHF) Operational Requirements Document (ORD) was validated by the Joint Requirements Oversight Council (JROC) on 22 Mar 99, and development cost estimates are included in the budget.

(U) Fleet Satellite Communications includes Sensitive Compartmented Information (SCI) Automated Digital Network System (ADNS), which provides real time indications and warning communications support and enhanced SCI interoperability with other services, agencies, and allies permitting a level of integration not available with current systems.

(U) The Mobile User Observer System (MUOS) program develops the next generation DoD narrowband communications satellite constellation. The current UHF Follow-On (UFO) constellation is expected to degrade below acceptable availability parameters and will require replacement by FY07. In addition, new user requirements have been identified and validated as improvements in warfighter tactics, and strategies have been modified to incorporate new concepts and technologies. The joint MUOS Integrated Product Team (IPT) has developed an acquisition strategy to address the exponential growth of narrowband communications demands, which has resulted in identifying the need to explore new approaches to acquiring satellite based communications capabilities. This program builds on state of the art technologies and commercial practices to develop a totally responsive joint warfighter system.

(U) An eleventh UFO satellite is being procured as a gapfiller to maintain the current UFO constellation until the MUOS can be put in place. The UFO receiver used on all previous UFOs is obsolete and no longer available. The contractor will develop and test a replacement UHF digital receiver for the UFO gapfiller satellite.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational system.

**R-1 Shopping List – Item No 182-1 of 182-18**

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification**

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EXHIBIT R-2, FY2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROGRAM ELEMENT TITLE: Satellite Communications (Space)

B. Program Change Summary  
(U) Funding:

FY 1999: Congressional reduction associated with Inflation Savings -\$ 83K. Transfer for SBIR -\$ 401K and +\$ 445K for Miscellaneous Department Adjustments.

FY 2000: +\$ 29,101K Program Reassignment and -\$ 219K Miscellaneous Department Adjustments. \$991K Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

FY 2001: +\$ 15,653K Program Reassignment, +\$ 11,500K MILSATCOM, +\$ 2,000K EHF Terminals, and -\$304K Miscellaneous Department Adjustments.

R-1 Shopping List -- Item No 182-2 of 182-18

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Exhibit R-2, RDT&E Budget Item Justification



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**EXHIBIT R-2a, FY2001 RDT&E,N PROJECT JUSTIFICATION**

**DATE: FEB 2000**

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0303109N**      **PROJECT NUMBER: X0728**  
**PROGRAM ELEMENT TITLE: Satellite Communications (Space)** **PROJECT TITLE: EHF SATCOM Terminals**

Cost (\$ in Thousands)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
X0728 EHF SATCOM Terminals	15,668	8,447	9,323	10,570	10,693	11,852	8,071	CONT.	CONT.

**A. Mission Description and Budget Item Justification:**

(U) Navy Extremely High Frequency (EHF) Satellite Communications (SATCOM) Program provides for the development and production of terminals to provide anti-jam, low probability of intercept/detection communications capability for Command and Control of the fleet. The terminals will provide physical and electromagnetically survivable, worldwide communications in the current and projected electromagnetic and nuclear threat environments. Navy EHF terminals are interoperable with Army and Air Force terminals and will operate with Milstar as well as EHF packages on-board Ultra High Frequency (UHF) Follow-On (UFO) Satellites 4 through 11 and FLTSATCOM Satellites 7 and 8. The increased capability provided by EHF terminals is accomplished by use of the wider bandwidths available at extremely high frequencies, narrow antenna beamwidths, spread spectrum techniques, on-board satellite processing, and advanced signal processing technology.

(U) A Medium Data Rate (MDR) capability is currently under development to utilize the capabilities on Milstar II satellites DFS-4 through DFS-7. MDR will provide the only protected (jam resistant and low probability of intercept/detection) MDR data rates from 4.8 kilobits per second (Kbps) to 1.544 megabits per second (Mbps) to the majority of the fleet.

(U) The Navy EHF Communications Controller (NECC) provides automated, netted tactical data information exchange over jam resistant EHF satellite links. The NECC will provide for load and channel sharing, resource management, communications management and planning, network control and monitoring, and packet switching.

(U) The Time Division Multiple Access (TDMA) Interface Processor (TIP) will support wide area network (WAN) implementation through reliable, efficient, netted data exchange using MDR services. The MDR TIP combines support for general purpose internet protocol (IP) data delivery and high speed, rapid delivery of tactical data within a single system architecture. TIP supports single-beam, multi-beam, and multi-satellite networks. TIP development supports implementation of tactical networks concurrent with deployment of MDR.

(U) Advanced EHF is the follow-on satellite communications system that replenishes the existing Milstar I/II (LDR/MDR) satellite constellations. The Advanced EHF system will be compatible with today's Navy LDR/MDR terminals, and provide increased communications capability to the warfighter. The Advanced EHF system provides an increase in single service capability from 1.5 Mbps to 8 Mbps, increases the number of coverage areas, and retains A/J, LPI protection characteristics.

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EXHIBIT R-2a, FY2001 RDT&E,N PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X0728

PROGRAM ELEMENT TITLE: Satellite Communications (Space)PROJECT TITLE: EHF SATCOM Terminals

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) (\$7,511) Performed MDR software corrections resulting from MST-6000 testing with flight model MDR satellite. Continued MDR ILS development; prepared MDR software documentation; performed software configuration management; performed system testing; supported installation, checkout, and integration of EDM antenna/pedestals on operational platforms, EDM MDR modems, and field change kits in support of MST testing; and continued MDR SATSIM development and modifications.
- (U) (\$ 700) Performed ship and shore integration for MDR upgrade.
- (U) (\$ 900) Performed MST-8000 development testing with initial AN/USC-38(V) with MDR, and Army MDR terminal.
- (U) (\$1,839) Performed TECHEVALs for Navy MDR and prepare for Milstar MDR OPEVALs and IOT&E.
- (U) (\$1,983) Continued development of NECC/TIP modifications. Conducted developmental and operational testing of MDR capable NECC units.
- (U) (\$1,290) Developed modifications required to maintain compatibility with future EHF satellite constellations (i.e., Advanced EHF). Investigated antenna technology advancements including phased array and flat plate antennas. Began investigation of Radar Cross Section (RCS) vulnerability reduction measures.
- (U) (\$1,445) Continued terminal and development engineering analysis and management.

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Exhibit R-2a, RDT&E Project Justification

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EXHIBIT R-2a, FY2001 RDT&E,N PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X0728

PROGRAM ELEMENT TITLE: Satellite Communications (Space)PROJECT TITLE: EHF SATCOM Terminals

2. (U) FY 2000 PLAN:

- (U) (\$3,716) Complete development of EDM MDR modems and perform integration activities with MDR Satellite Simulator (SATSIM). Continue software regression testing, anomaly resolution, and upgrade ADR to provide diagnostic debug capability.
- (U) (\$ 1,420) Continue testing for Navy MDR and participate in Milstar MDR OPEVAL/IOT&E for multiple MDR constellations. Perform MST-6000 Milstar Flight 5 testing and MST-8000 on-orbit test checkout Milstar Flight 4 with AN/USC-38(V) with MDR and Army MDR terminal to verify compatibility and Space Segment Capabilities.
- (U) (\$ 1,417) Continue development of TIP/NECC modifications. Extend IP Capability from MDR to LDR, add IDS 8648 GFCEP Interface.
- (U) (\$1,000) Continue Advanced EHF system engineering analysis and specification generations to develop AEHF modem and antennas to interface with Legacy AN/USC-38(V) NESP Communications Electronic Group (CEG) and Follow On Terminal (FOT).
- (U) (\$ 894) Continue terminal development engineering analysis and management.

3. (U) FY 2001 PLAN:

- (U) (\$ 1,928) Complete development of TIP/NECC modifications.
- (U) (\$4,607) Begin design and finish specification preparation for Advanced EHF, continue system engineering and studies.
- (U) (\$ 1,755) Perform MST-8000 on-orbit test checkout Milstar Flight 5 with AN/USC-38(V) with MDR and Army MDR terminal to verify compatibility and Space Segment Capabilities and terminal segment interoperability/compatibility .
- (U) (\$1,033) Continue terminal development engineering analysis and management.

R-1 Shopping List – Item No 182-5 of 182-18

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Exhibit R-2a, RDT&E Project Justification

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**EXHIBIT R-2a, FY2001 RDT&E,N PROJECT JUSTIFICATION**

**DATE: FEB 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0303109N**

**PROJECT NUMBER: X0728**

**PROGRAM ELEMENT TITLE: Satellite Communications (Space)PROJECT TITLE: EHF SATCOM Terminals**  
**B. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in Thousands)**

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO COMPLETE	TOTAL PROGRAM
OPN SHIP* 321000	48,705	87,647.							
OPN SHIP & Shore* 321500			125,293	98,049	47,820	21,913	12,392	CONT	CONT
OPN SHORE* 322000	13,927	31,675.							

\*Includes EHF terminal installation costs.

(U) Related RDT&E:

- (U) PE 0303603F, Milstar
- (U) PE 0303601F, Air Force Satellite Communications
- (U) PE 0303142A, Army Extremely High Frequency Communications Terminal

**C. (U) ACQUISITION STRATEGY:**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Program Milestones	N/A	Milstar II Launch (Flight 4) 5/00	Milstar II Launch (Flight 5) 12/00
Engineering Milestones	N/A	N/A	N/A
T&E Milestones	MST 6000 (Flight 4) 7/99	MST 6000 (Flight 5) 5/00 MST 8000 (Flight 4) 6/00	MST 8000 (Flight 5) 1/01
Contract Milestones	N/A	N/A	N/A

**D. (U) SCHEDULE PROFILE: N/A**

**R-1 Shopping List – Item No 182-6 of 182-18**

**UNCLASSIFIED**

**Exhibit R-2a, RDT&E Project Justification**

**UNCLASSIFIED**

**EXHIBIT R-3, FY 2001 RDT&E,N PROJECT COST ANALYSIS**

**DATE: FEB 2000**

**BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0303109N      PROJECT NUMBER: X0728**  
**PROGRAM ELEMENT TITLE: Satellite Communications (Space)PROJECT TITLE: EHF SATCOM Terminals**

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY01 Cost	FY 01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Product Development												
Prime Mission Equipment	SS/CPFF	Raytheon Marlborough, MA	29,501	7,676	12/98	4,786	12/99	5,585	12/00	CONT	CONT	
Prime Mission Equipment	WX	SSC SD	10,194	1,835	11/98	481	11/99	578	11/00	CONT	CONT	
Prime Mission Equipment	Various	Other	4,641	2,170	12/98	675	12/99	422	12/00	CONT	CONT	
Subtotal Product Development			44,336	11,681		5,942		6,585		CONT	CONT	
Remarks:												

Support Cost/Management Services												
Program Management	WX	SSC SD	5,532	1,029	12/98	346	12/99	660	12/00	CONT	CONT	
Program Management	WX	NUWC	4,712	421	12/98	247	12/99	489	12/00	CONT	CONT	
Program Management	Various	Other	3,676	486	12/98	361	12/99	389	12/00	CONT	CONT	
Subtotal Support			13,920	1,936		954		1,538		CONT	CONT	
Remarks												

**R-1 Shopping List – Item No 182-7 of 182-18**  
**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis**

**UNCLASSIFIED**

**EXHIBIT R-3, FY 2001 RDT&E,N PROJECT COST ANALYSIS**

**DATE: FEB 2000**

**BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0303109N      PROJECT NUMBER: X0728**  
**PROGRAM ELEMENT TITLE: Satellite Communications (Space)PROJECT TITLE: EHF SATCOM Terminals**

Cost Categories Test & Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	Various	Various	3,566	2,051	12/98	1,551	12/99	1,200	12/00	CONT	CONT	
Subtotal T&E			3,566	2,051		1,551		1,200		CONT	CONT	
Remarks												
Management Services												
Subtotal Management												
Remarks												
Total Cost			61,822	15,668		8,447		9,323		CONT	CONT	
Remarks												

**R-1 Shopping List – Item No 182-8 of 182-18**  
**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis**

**UNCLASSIFIED**

**EXHIBIT R-2a, FY 2001 RDT&E,N PROJECT JUSTIFICATION**

**DATE: FEB 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0303109N**

**PROJECT NUMBER: X0731**

**PROGRAM ELEMENT TITLE: Satellite Communications (Space)**

**PROJECT TITLE: SCI/ADNS**

Cost (\$ in Thousands)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
X0731 Fleet Satellite Communications	1,816	2,814	1,480	1,012	0	0	0	CONT	CONT

**A. Mission Description and Budget Item Justification:**

(U) The Sensitive Compartmented Information (SCI) Automated Digital Network System (ADNS) implements the Integrated Special Intelligence Communications portion of the ADNS architecture, to provide services for transfer of Special Intelligence (SI) information between ships, aircraft, and shore activities in support of joint and combined operations. SCI ADNS has been combined into the SI communications architecture and will provide real time indications and warning support to joint and component commanders through reliable high speed transfer of sensor data and intelligence information. Enhanced interoperability with other services, agencies, and allies will permit a level of integration of SI operations not achievable with current systems. The Joint ultra high frequency (UHF) Military Satellite Communications Network Integrated Control System (JMINT) Control system will provide dynamic centralized control of joint 5-kHz and 25kHz UHF military satellite communications (MILSATCOM) voice and data resources (channels and Time Division Multiple Access (TDMA) time slots via a globally integrated system of four control stations to be located at each of the three Naval Computer and Telecommunications Area Master Station (NCTAMS) sites plus Naval Computer and Telecommunications Station (NCTS) Guam.

**NOTE:** SCI ADNS To Complete Funding will be addressed during POM 02.

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

**1. (U) FY 1999 ACCOMPLISHMENTS:**

- (U) (\$1,816) Continued implementation of SCI ADNS.

**R-1 Shopping List – Item No 182-9 of 182-18**

**UNCLASSIFIED**

**Exhibit R-2a, RDT&E Project Justification**

**UNCLASSIFIED**

**EXHIBIT R-2a, FY 2001 RDT&E,N PROJECT JUSTIFICATION**

**DATE: FEB 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0303109N**

**PROJECT NUMBER: X0731**

**PROGRAM ELEMENT TITLE: Satellite Communications (Space)**

**PROJECT TITLE: SCI/ADNS**

**2. (U) FY 2000 PLAN:**

- (U) (\$2,814) Transition SCI ADNS functionality to Windows NT/IT 21 compliant architecture to include re-hosting to Cryptologic Workstation environment. Integrate and implement SCI ADNS Build II. Continue development of voice, data and video integration into SCI ADNS environment. Preparation for SCI Defense Messaging System integration. Developmental Testing (DT) and Follow on Operational Testing and Evaluation (FOT&E) of SCI ADNS.

**3. (U) FY 2001 PLAN:**

- (U) (\$1,480) Continue integration and implementation of SCI/ ADNS and associated Special Intelligence Communication capabilities. FOT&E, Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA) of SCI /ADNS will be accomplished.

**B. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in Thousands)**

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY2004	FY2005	TO COMPLETE	TOTAL PROGRAM
OPN SHIP* 321000	2,729	4,341							
OPN SHIP* 321500			4,293	3,132	7,217			CONT	CONT
OPN SHORE* 322000	687	693							

\*Includes terminal installation costs.  
(U) Related RDT&E: N/A

**R-1 Shopping List – Item No 182-10 of 182-18**

**UNCLASSIFIED**

**Exhibit R-2a, RDT&E Project Justification**



**UNCLASSIFIED**

**EXHIBIT R-2a, FY 2001 RDT&E,N PROJECT JUSTIFICATION**

**DATE: FEB 2000**

**BUDGET ACTIVITY: 7**                      **PROGRAM ELEMENT: 0303109N**                      **PROJECT NUMBER: X0731**  
**PROGRAM ELEMENT TITLE: Satellite Communications (Space)**                      **PROJECT TITLE: SCI/ADNS**

**C. (U) ACQUISITION STRATEGY:**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Program Milestones	N/A	SCI ADNS 2 IOC 6/00	
Engineering Milestones	N/A	SCI ADNS 2 PCA 3/00	
T&E Milestones	SCI ADNS 1 OT1 7/99	SCI ADNS 2 DT 7/00 OT 9/00	SCI ADNS 2 DT 7/01 FOTE 9/01
Contract Milestones	N/A	N/A	N/A

**R-1 Shopping List -- Item No 182-11 of 182-18**  
**UNCLASSIFIED**

**Exhibit R-2a, RDT&E Project Justification**

**UNCLASSIFIED**

**EXHIBIT R-3, FY 2001 RDT&E,N PROJECT COST ANALYSIS**

**DATE: FEB 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0303109N**

**PROJECT NUMBER: X0731**

**PROGRAM ELEMENT TITLE: Satellite Communications (Space)**

**PROJECT TITLE: SCI/ADNS**

**D. SCHEDULE PROFILE: See paragraph C.**

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
1.1.1 Prime Mission Product	FPI	Titan	6,309	0		0		0		0	6,309	
1.1.1.1 Prime Mission Product	FFP	SRC	18,505	0		0		0		0	18,505	
1.1.1 Prime Mission Product	PD	NAV SUP/SR C	3,946	1,277	Dec 98	1,848	Dec 99	528	Dec 00	343	7,942	
1.1.1 Prime Mission Product	VAR	VAR	9,654	125	Dec 98	300	Dec 99	300	Dec 00	189	10,579	
Subtotal Product Development			38,414	1,402		2,148		828		532	43,335	
Remarks:												
1.1.1.1 Prime Mission Product	CPFF	CSC	3,588	0		0		0		0	3,588	
1.1.1 Prime Mission Product	PD	NAVAIR/ISC	1,176	0		0		0		0	1,176	
1.1.1 Prime Mission Product	VAR	VAR	9,343	0		0		0		0	9,343	
GFE												
Subtotal Support			14,107	0		0		0		0	14,107	
Remarks												

**R-1 Shopping List – Item No 182-12 of 182-18**

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis**

## UNCLASSIFIED

## EXHIBIT R-3, FY 2001 RDT&amp;E,N PROJECT COST ANALYSIS

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X0731

PROGRAM ELEMENT TITLE: Satellite Communications (Space)

PROJECT TITLE: SCI/ADNS

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
1.2.5 System T&E	N/A	SSC SD	0	202	Dec 98	433	Dec 99	420	Dec 00	247	1,302	
1.2.5 System T&E	N/A	OPT/EFOR	0	80	Dec 98	100	Dec 99	100	Dec 00	100	380	
1.2.5 System T&E	VAR	VAR	9,296	0		0		0		0	9,296	
Subtotal T&E			9,296	282		533		520		347	10,978	
Remarks												
1.1.3 Program Management	CPFF	CSC	3,588								3,588	
1.1.3 Program Management	PD	NAV/AIR/ISC	1,176								1,176	
1.1.3 Program Management	N/A	ACS	410	132	Dec 98	133	Dec 99	132	Dec 00	133	940	
1.1.3 Program Management	VAR	VAR	9,343								9,343	
Subtotal Management			14,517	132		133		132		133	15,047	
Remarks												
Total Cost			76,334	1,816		2,814		1,480		1,012	83,467	

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UNCLASSIFIED

Exhibit R-3, RDT&amp;E Project Cost Analysis

**UNCLASSIFIED**

**EXHIBIT R-2a, FY 2001 RDT&E,N PROJECT JUSTIFICATION**

**DATE: FEB 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0303109N**

**PROJECT NUMBER: X2472**

**PROGRAM ELEMENT TITLE: Satellite Communications (Space)**

**PROJECT TITLE: Satellite Development**

Cost (\$ in Thousands)

PROJECT NUMBER & TITLE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2472 Satellite Development	0	28,941	26,975	30,667	0	0	0	0	CONT

**A. Mission Description and Budget Item Justification:**

(U) This program provides for: (1) the development of the digital receiver for the UHF Follow-On (UFO) F11 gapfiller satellite and (2) the development of the next generation DoD narrowband communications satellite constellation.

(U) The RDT&E effort for the UFO F11 gapfiller satellite is to develop and test a digital receiver to replace the obsolete analog receiver used on UFO F1-F10. The F11 is being procured to maintain the health of the UFO constellation until the Mobile User Objective System (MUOS) system can be put in place.

(U) The current UFO constellation is expected to degrade below acceptable availability parameters and will require replacement by FY07. In addition, new user requirements have been identified and validated as improvements in warfighter tactics, and strategies have been modified to incorporate new concepts and technologies. The joint MUOS Integrated Product Team (IPT) has developed an acquisition strategy to address the exponential growth of narrowband communications demands, which has resulted in identifying the need to explore new approaches to acquiring satellite based communications capabilities. This program builds on state of the art technologies and commercial practices to develop a totally responsive joint warfighter system.

(U) This RDT&E effort supports the program objectives by assisting in identifying the most effective way to field a new system by FY07. Four Concept Exploration contracts were awarded in early FY00. This budget also supports a year long Analysis of Alternatives for MUOS. The resulting system concepts will be evaluated for feasibility and used as a basis for the two Risk Reduction contracts to be awarded in FY01.

**R-1 Shopping List – Item No 182-14 of 182-18**

**UNCLASSIFIED**

**Exhibit R-2a, RDT&E Project Justification**

UNCLASSIFIED

EXHIBIT R-2a, FY 2001 RDT&E,N PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X2472

PROGRAM ELEMENT TITLE: Satellite Communications (Space)

PROJECT TITLE: Satellite Development

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY99 PLAN:

- (U) (\$0) N/A

2. (U) FY00 PLAN:

- (U) (\$4,000) Award four Concept Exploration contracts for MUOS.
- (U) (\$23,441) Design and test a digital receiver for UFO F11 gapfiller.
- (U) (\$1,500) Fund required independent Analysis of Alternatives for MUOS.

3.(U) FY01 PLAN

- (U) (\$26,975) Award up to two Risk Reduction contracts for MUOS.

B. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in Thousands)

NUMBER TITLE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) WPN Line 243300 Fleet Satellite Communication Follow-On	0	9,754	170,537	0	0	0	0	0	181,500

C. (U) ACQUISITION STRATEGY  
(U) RELATED RDT&E: N/A

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UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification

UNCLASSIFIED

EXHIBIT R-2a, FY 2001 RDT&E,N PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303109N

PROJECT NUMBER: X2472

D. (U) SCHEDULE PROFILE:  
MUOS

PROGRAM ELEMENT TITLE: Satellite Communications (Space)

PROJECT TITLE: Satellite Development

FY 1999  
4Q-MS 0

FY 2000

FY2001

Program  
Milestones

Engineering  
Milestones

T&E  
Milestones

Contract  
Milestones

3Q-Concept  
Delivered

2Q - MS 1

1Q-Multiple CE contracts  
Awarded

2Q-Risk Reduction  
Contracts Awarded

UFO GAPFILLER

Program  
Milestone

Engineering  
Milestone

T&E  
Milestone

Contract  
Milestone

SS/FFP  
1Q-Mod for F11

(U) Acquisition Strategy

R-1 Shopping List - Item No 182-16 of 182-18

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Exhibit R-2a, RDT&E Project Justification

**UNCLASSIFIED**

**EXHIBIT R-2a, FY 2001 RDT&E,N PROJECT JUSTIFICATION**

**DATE: FEB 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0303109N**

**PROJECT NUMBER: X2472**

**PROGRAM ELEMENT TITLE: Satellite Communications (Space)**

**PROJECT TITLE: Satellite Development**

**UFO F11:** A modification for F11 will be added to the current UFO contract. The RDT&E,N funds are to redesign the obsolete UHF receiver (FY00)

**MUOS:** A Milestone 0 memorandum is expected to designate the MUOS on ACAT I program under Navy responsibility. Concept Exploration contracts will be awarded in early FY00. After Government evaluation of the studies delivered under the Concept Exploration contracts, up to two Risk Reduction Contracts will be awarded in FY01. Funding for the Government's required independent Analysis of Alternatives will also be provided.

**R-1 Shopping List – Item No 182-17 of 182-18**

**UNCLASSIFIED**

**Exhibit R-2a, RDT&E Project Justification**

## EXHIBIT R-3, RDT&amp;E, N BUDGET PROJECT COST ANALYSIS

DATE: FEB 2000

## BUDGET ACTIVITY: 7

**PROGRAM ELEMENT: 0303109N**

**PROGRAM ELEMENT: 0303109N**  
**PROGRAM ELEMENT TITLE: Satellite Communications (Space)**

**PROJECT NUMBER: X2472**

**PROJECT TITLE: Satellite Development**

Exhibit R-3 Cost Analysis (page 1)										Date: July 1999		
APPROPRIATION: RDT&E,N			BUDGET ACTIVITY : 7		PROGRAM ELEMENT: 0303109N					Mobile User Segment X2472		
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
MUOS CE Contracts	COM/FP	Various	0	0	N/A	2,840	Oct 99	25,575	Feb 01	0	2,840	2,840
MUOS Risk Reduction	COM/FP	Various	0	0	N/A	1,500	Oct 99			30,667	56,242	56,242
AoA for MUOS	MIPR	Various									1,500	1,500
UFO Gapfiller – Digital Receiver	SS/FP	Hughes, El Segundo	0	0	N/A	21,751	Oct 99	0	Oct 00	0	21,751	21,751
Subtotal Product Development			0	0		26,091		25,575		30,667	82,333	82,333
Remarks:												
Support Cost												
Program Support	Var	Program Support	0	0	N/A	2,850	Oct 99	1,400	Oct 00		4,250	4,250
Subtotal Support Cost			0	0		2,850		1,400			4,250	4,250
Rem												
Total Cost			0	0		28,941		26,975		30,667	86,583	86,583

**R-1 Shopping List – Item No 182-18 of 182-18**

**UNCLASSIFIED**

## Exhibit R-3, RDT&E,N Project Cost Analysis



UNCLASSIFIED

EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303140N

PROGRAM ELEMENT TITLE: Information Systems Security Program

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO COMPLETE	TOTAL PROGRAM
X0734 Information Systems Security									
20,218	22,854	21,530	22,560	22,908	27,012	27,165	CONT.	CONT.	
TOTAL	20,218	22,854	21,530	22,560	22,908	27,012	27,165	CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The goal of the Navy Information Systems Security (INFOSEC) Program (ISSP) is to ensure the continued protection of Navy and Joint information and information systems from hostile exploitation and attack. With the advent of the information age, the network environment, and the evolving reliance on distributed information systems that communicate via computer networks, protecting these networks, the data flowing on the networks, and the attached information systems has become critical to the effective performance of the Navy mission. The fundamental nature of these distributed systems in modern Naval and Joint war fighting means that attacks against the systems are increasingly likely. An adversary has a much broader selection of attack types from which to choose than in the past. In addition to the traditional attacks that involve the theft or eavesdropping of information, attacks involving malicious changes to critical information, changes to the functioning of critical systems, or the destruction of systems and networks have become much more feasible. Since many Navy information systems are based on commercially available technologies, an adversary often has access to the very technologies that are targeted for exploitation.

(U) The complexity of Navy distributed systems, and the rapid rate of change of the underlying commercial and government technologies; makes the provision of security an increasingly complex and ever changing problem. Technologies involved with providing security are a mix of computer security, network security, and cryptographic security which must be carefully developed and integrated into many parts of the Navy information infrastructure. The placement of technologies and the mix of technologies required must evolve quickly to meet the rapidly evolving threats and vulnerabilities. This is a departure from years past when protections were mostly associated with the eavesdropping threat and were primarily provided by cryptographic devices. In order to gain the requisite levels of protection, the various security technologies must be applied in a carefully architected manner. Information Assurance (IA) is the comprehensive management of both the information and the information system security disciplines. At the same time the IA problem is becoming more complex, demands to move information between security levels and to and from coalition partners are increasing.

R-1 Shopping List - Item No. 183 - 1 of 183 - 16

UNCLASSIFIED

Exhibit R-2, RDT&E,N Budget Item Justification

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EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303140N

PROGRAM ELEMENT TITLE: Information Systems Security Program

(U) The Navy ISSP RDT&E program is structured to stay abreast of the exploding information system security problem and ensure that Navy systems possess the requisite level of protection. To model the way DOD information systems are evolving (rather than being one-time developments), the ISSP RDT&E program is structured to continuously evaluate technical directions/options. The program develops frameworks and architectures based on mission threats, exploitation risks, integrated Joint information system efforts, etc. The program provides the resources to determine the proper security functions and placement of the functions; uses the frameworks and architectures to coordinate Navy work with DoD and National Security Agency (NSA) IA efforts. The program also examines commercial technologies to determine their fit within the architectures; provides feedback to vendors and standards bodies about what Navy requires in commercial products. It develops or tailors technologies, standards, and processes to Navy requirements if necessary; prototypes systems or portions of systems and examines their operational utility in operational Navy settings, and provides IA expertise and engineering to Navy and Joint information system developments. All technology development efforts are aimed at specific Navy and Joint IA problems and are designed to transition to procurement as soon as ready.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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Exhibit R-2, RDT&E,N Budget Item Justification

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EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0303140N  
PROGRAM ELEMENT TITLE: Information Systems Security Program

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO COMPLETE	TOTAL PROGRAM
X0734 Information Systems Security	20,218	22,854	21,530	22,560	22,908	27,012	27,165	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Navy RDT&E program analyzes existing information assurance products and solutions, and develops improved, interoperable communications security equipment and methods, computer security technology and other high assurance techniques/solutions to protect voice, video and data communications from exploitation and provide IA for critical Navy information systems. This program element is a continuing effort to modernize obsolete computer security and cryptographic equipment and ancillaries with state-of-the-art replacements in order to counter evolving and increasingly sophisticated threats. Communication Security (COMSEC) replacements, in most cases, will use embedded modules incorporating (NSA approved crypto engines) and programmable cryptographic technology. The technical strategy and framework efforts are focused on the use of IA technology (e.g., COMSEC, COMPUSEC and NETSEC technology) to counter a wide variety of INFOSEC threats in a Navy environment. Processes and tools are being evaluated, developed and/or tested to design and evaluate the security of systems that integrate IA products. Technology base efforts include: developing new secure voice prototypes; developing or applying technology for a new family of programmable COMSEC modules; developing or applying network security products, (including technology to interconnect networks of dissimilar classification, and address the Multi-level Security (MLS) technology requirements for the DON); and developing or applying public key infrastructure and associated access control technologies (such as Smart Cards and similar security tokens). The resulting expertise is applied to a wide variety of Navy development programs that must integrate IA technology.

(U) The expertise in the DON RDT&E program is applied to the development of Navy INFOSEC products and systems, computer and other high assurance technology, development of missing technology (e.g., network security technology and certification methods), and the development of standards, processes and tools, etc). These efforts encompass the selective evaluation, integration and test of Commercial off-the-shelf (COTS)/Non-developmental Item (NDI) IA security products into prototype capabilities such as firewalls, guards, virtual private networks, and network monitoring systems to provide for monitoring, detecting,

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Exhibit R-2, RDT&E,N Budget Item Justification

UNCLASSIFIED

EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303140N

PROGRAM ELEMENT TITLE: Information Systems Security Program

isolating and reacting to network intrusions throughout the DON. With the Navy now making profound changes in the way it approaches communications and computer security, the current operating environment has virtually eliminated the traditional distinction between telecommunications and information systems. The Navy RDT&E program analyzes INFOSEC and high assurance equipment and solutions, and develops improved, interoperable communications security equipment and methods to protect information from exploitation and provide IA for critical Navy systems. The project provides a continuing effort to modernize obsolete cryptographic and network security equipment and ancillaries with state-of-the-art replacements in order to meet the evolving threat on Navy communication networks. Because INFOSEC is a cradle-to-grave discipline, this program develops the technology and methodology to systems in development, production and operation, and develops the infra-structure needed to support and evaluate the security of deployed systems. These objectives are pursued by using equipment/systems focusing on information assurance technology and their use and impact on distributed information systems.

(U) Under the Navy Secure Voice program, technology to provide high grade, secure tactical and strategic voice connectivity shall be developed and assessed. Efforts shall focus on designing, demonstrating and integrating a secure voice capability for IT-21 and other Command, Control, Communications and Computers (C4I) programs and initiatives. Technology to support the secure integration and transport of voice, video, and data over Internet Protocol (IP) and Asynchronous Transfer Mode (ATM) networks will be prototyped and demonstrated to support Navy Marine Corps Internet (NMCI) and IT-21 applications. Additionally, the secure voice program will examine digital cellular and land mobile satellite secure voice technology. Under the Navy Security Management Infrastructure (SMI) program, new emerging technology and enhanced capabilities shall be developed, evaluated and applied to the Electronic Key Management System (EKMS) and other Navy Information Systems. Additional efforts shall focus on the architecture, design, and development of systems to manage the security parameters (for example, encryption keys) necessary to the operation of the systems developed by the Secure Data and Secure Voice portions of the ISSP. This includes the application of Public Key Infrastructure (PKI) and Certificate Management Infrastructure (CMI) technology, and the development of improved techniques for key and certificate management to support emerging, embedded cryptographic technology. Under the Secure Data program, efforts focus on architectures, designing, acquiring, demonstrating and integrating the IA technologies into Navy distributed information systems (e.g., IT-21, NMCI). It involves the injection of security technologies and solutions in Navy C4I systems to maintain pace with the evolving infrastructure of the internet and expanding network capabilities of ashore and afloat users. Secure data RDT&E,N focuses primarily on designing and proving IA solutions for IT-21 and the NMCI (and the broad and complex underlying and interconnected metropolitan, base, and local area networks). This portion of the ISSP supports delivery of network security engineering expertise needed to stand-up the NMCI and securely deploy IT-21 constituent systems such as Advanced Digital Network System (ADNS), Global Command and Control System-Maritime (GCCS-M) and Base Level information Infrastructure

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Exhibit R-2, RDT&E,N Budget Item Justification

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EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303140N

PROGRAM ELEMENT TITLE: Information Systems Security Program

(BLII). It involves the design of standard network security suites for various layers of the Navy's network infrastructure, from wide area network boundary points to local area network and workstation protections. It also provides solutions to the coalition operations problem and to the Navy cryptographic equipment obsolescence problem.

1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) (\$2,110) Continued development of the programmable embedded COMSEC prototype and began integration and system testing. The first targeted application is the Submarine LF/VLF VME Bus Receiver (SLVR) system for replacement of the KG-3X family of cryptos. Initiated efforts to address the use of programmable embedded COMSEC solutions and other cryptographic technology for replacement of aging and obsolete cryptos in Navy systems (e.g., Advanced Narrow-Band Digital Voice Terminal (ANDVT), VINSON, KG-84, KG-40 in support of Link-11, and the Thornton family in support of Link-16). Identified applications and technology for new ship construction and other platforms, as well as for new emerging communications backbones/circuits in support of Navy initiatives such as IT-21/NMCI.
- (U) (\$2,095) Continued development of EKMS Tier 1, including completion of all software builds and testing.
- (U) (\$4,660) Began the development of EKMS Phase IV. This included development of requirements for Data Transfer Device (DTD) 2000, and for addressing incorporation of key management solutions for IT-21/NMCI. Addressed the integration of PKI/CMI technology, integration of key management and net planning capabilities and functions, and support for the incorporation of the Key Systems Operation (KSO) exchange. Also developed a Navy Single Point Command, Control and Keying (NSPC<sup>2</sup>K) design as a solution for Navy platforms, embedded cryptographic technology and associated crypto replacement efforts. Continued the development, evaluation and application assessment of high assurance products, and provided system security and C&A engineering and testing for key management components and systems.
- (U) (\$475) Began the design, development, application and evaluation of PKI/CMI techniques (e.g., benign key), netted re-key technology, application of COTS key and certificate management technology, key/net management integration, key and certificate workstation integration, key fill device and delivery technology, new cryptographic algorithm developments, and new approaches to cryptographic technology (e.g., software and chaos theory based). Provided the design, development, application and evaluation of new key generation and distribution techniques and technology. Conducted laboratory assessments of the latest NSA and COTS key management technology and products, and demonstrated prototype key and certificate management systems.

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Exhibit R-2, RDT&E,N Budget Item Justification

UNCLASSIFIED

EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303140N

PROGRAM ELEMENT TITLE: Information Systems Security Program

- (U) (\$900) Began development of the Navy Security Management Infrastructure (NSMI) architecture and design. This included the development of the concept, architecture, and requirements for the integration of PKI and CMI components and technology for Navy applications and sites. Evaluated and assessed the use and application of medium assurance commercial products for PKI/CMI public key and certificate applications through a prototype pilot initiative involving up to 5000 users focused on individual messaging and web server security. Assessed the feasibility of integrating PKI/CMI technology with key management products and initiatives.
- (U) (\$2,729) Continued the design, development and assessment of security solutions/capabilities for next generation voice systems. Continued research into new secure voice technology, developing technology and techniques for secure voice over government and COTS communications backbones, specifically addressing wireless applications and strategic and tactical communications. Supported the integration of secure voice services in support of IT-21/NMCI. Developed/assessed the requirements for integrated secure voice/data, and provided system security and Certification & Accreditation (C&A) engineering and testing for secure voice components and systems. Continued the development of voice algorithms and security techniques, and conducted assessments of COTS secure voice technology and products. This included development of secure voice technology to support Navy unique requirements/applications (e.g., point-to-multipoint) for new ship construction, existing ship platforms, and for shore sites.
- (U) (\$200) Continued to research secure voice and biometric access consortia. Performed research into new high assurance secure voice technology, including wireless cellular and satellite technology.
- (U) (\$620) Developed a security architecture for NMCI and for selected Navy distributed information system development programs. Ensured that developed architecture provides proper protection as technology, DOD missions, and the threat all evolve. Provided inputs to the major Navy and joint initiatives that are defining and building distributed systems including IT-21, NMCI, and large development programs including Global Command and Control System, Maritime (GCCS-M), Global Command and Control System (GCCS), DMS, JMCMS and others. Included both defensive protections as well as intrusion detection system capabilities.
- (U) (\$2,692) Evaluated, tested and integrated distributed information system security technology solutions into Navy information systems. This included the examination and selection of various components, such as firewalls, intrusion detection systems, virtual private networking systems, public

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Exhibit R-2, RDT&E,N Budget Item Justification

UNCLASSIFIED

EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303140N

PROGRAM ELEMENT TITLE: Information Systems Security Program

key based secure e-mail and web systems, and others as well as high assurance components for connection of Top Secret and SCI systems to lower level systems. Prototyped components at operational sites. Began examining alternatives for high speed network encryption (IP packet encryption at speeds of at least 100 Mbps) and scaleable boundary level security solutions.

- (U) (\$1,950) Provided developmental systems security engineering, C&A support to Navy information system developments such as GCCS-M, GCCS, DMS, JMCOMS, IT-21, NMCI, NSSN, LPD-17, SC-21, and others. Support focused on Information Technology Service Centers being designed in multiple repair regions, including San Diego, Norfolk and Hawaii. Focused on integration of the proper functions to ensure adherence to the common security architectures and to ensure that the security and performance of the tactical systems, including those operating at Top Secret and at SCI are consistent with Navy and DOD requirements.
- (U) (\$705) Continued developing and updating INFOSEC standards and engineering guidance documents to ensure they are consistent with the security architecture, rapidly changing technology, and the evolving threat. Included guidance for proper operational procedures for the use of the security protections at various levels of the NMCI architecture.
- (U) (\$550) Developed, prototyped, and tested solutions to the coalition interoperability problem including, development of a Multilevel Security (MLS) web server. Based on available security technologies as well as emerging architectural methods of providing interoperability across different security levels.
- (U) (\$532) Continue vulnerability/threat assessments and development and systems integration of network countermeasures tools (NVACM) efforts.

3. (U) FY 2000 PLAN:

- (U) (\$2,000) Continue development of programmable embedded COMSEC solutions for the KG-3X family of cryptos to satisfy requirements associated with SILVR for KG-3X replacement. Begin the development and implementation of benign keying technology for crypto replacement efforts. Initiate efforts to develop a flexible, digital modular cryptographic solution based on multi-channel, programmable technology (e.g., AIM, CORNFIELD) to replace a wide variety of aging and obsolete cryptos in existing and new navy communications systems/circuits (e.g., ANDVT, VINSON, KG-84, KG-40 in support of Link-11, and the

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Exhibit R-2, RDT&E,N Budget Item Justification

UNCLASSIFIED

EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303140N

PROGRAM ELEMENT TITLE: Information Systems Security Program

Thornton family in support of Link-16). This capability will yield significant benefits including simplified operation, improved interoperability, and reduced space and weight requirements. Identify and document performance parameters, form factors, and interface requirements for the digital modular cryptographic solution. These efforts will be fully coordinated with the NSA.

- (U) (\$4,025) Complete development of EKMS, and ensure compatibility with the Tier 0, Tier 2, and Tier 3 components and software.
- (U) (\$2,675) Continue the development of EKMS Phase IV for Tier 1, Tier 2 and Tier 3. This includes support for incorporation of enhanced key management capabilities/solutions for IT-21/NMCI. Address the development and inclusion of web-based technology and support for the incorporation of the KSO exchange. Begin the requirements definition for integration of certificate management and key management. Additional efforts focus on the development and prototyping of the NSPC<sup>2</sup>K design and solution for Navy platforms, supporting the development and the Navy's crypto replacement efforts. Conduct laboratory embedded cryptographic technology and the Navy's crypto replacement efforts. Conduct laboratory assessments of the latest NSA and industry COTS key management technology and products, and demonstrations of prototype key management systems. Provide system security and C&A engineering and testing for key management components and systems.
- (U) (\$2,385) Continue the design, development, evaluation and application of public key and certificate management infrastructure technologies and systems to support DoD and DON initiatives, including integration with IT-21/NMCI initiatives. Prototype and assess the use and application of medium and high assurance commercial products for PKI/CMI applications, including the assessment of these technologies over tactical communications paths. Continue assessing the feasibility of integrating PKI/CMI technology with key management products and initiatives. Work closely with the commercial developers and vendors, infuse technology and requirements into the commercial products, and support efforts to PKI-enable applications. Evaluate, assess, and integrate multiple related technologies including security tokens, such as smart cards, and virtual private networks (VPNs). Support the definition of standards for smart cards and the evolution of computer workstation technology to support the widespread introduction of smart card technology.
- (\$860) Continue the design, development and assessment of security solutions/capabilities for next generation voice systems. Develop prototypes/demonstrations to illustrate secure voice, video, and data capabilities over IP and ATM networks, specifically addressing quality of service and reliability issues. Continue research into new secure voice technology, developing technology and techniques for secure voice

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Exhibit R-2, RDT&E,N Budget Item Justification



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EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303140N

PROGRAM ELEMENT TITLE: Information Systems Security Program

over government and commercial communications backbones, specifically addressing wireline/wireless telephony and network applications applicable to strategic and tactical communications. Continue to develop and assess the technology for low data rate algorithms, voice compression technology in conjunction with cryptographic algorithm technology, and voice/speaker recognition. Investigate the application of digital cellular and satellite secure voice technology.

- (U) (\$823) Initiate the design, development and assessment of the Secure Voice-21 (SV-21). This includes the development and integration of the crypto gateways (i.e., network interface card, crypto interface card, and the voice processing card), crypto replacement technology, the SPC<sup>2</sup>K technology to support the embedded crypto replacements, and new voice algorithms (e.g., Mixed Excitation Linear Prediction (MELP)). This suite of equipment/solutions is targeted to support the LPD-17 class, the DDG-51 class, NNSN, and CVX class of ships by providing a secure voice solution for telephonic, tactical and secure voice problems, specifically addressing the IT-21 initiatives.
- (U) (\$250) Continue to support secure voice and biometric access consortia. Continued laboratory assessments of the latest NSA and industry INFOSEC technology and demonstrations of prototype voice systems. Continued research into new high assurance secure voice technology.
- (U) (\$650) Continue the evolutionary development of security architectures for IA that include virtually all Navy distributed information system development programs. Ensure the architecture evolves to provide proper protection as technology, DOD missions, and the threat all evolve. Provide inputs to the major Navy and joint initiatives that are defining and building distributed systems including IT-21, NMCI, the Joint Technical Architecture, and large development programs including GCCS-M, GCCS, DMS, ADNS, BLII and others. Include both defensive protections as well as intrusion monitoring in the architecture.
- (U) (\$3,736) Continue developing and testing distributed information system security solutions for Navy information systems. This includes the examination and selection of various components required by the architectures that may include firewalls, intrusion detection systems, virtual private networking systems, public key based secure e-mail and web systems, operating systems and others as well as high assurance components for connection of Top Secret and SCI systems to lower level systems. Examine and evaluate next generation network security components including scalable security products, ATM firewalls and intrusion detection systems, and sophisticated malicious code monitors. Design and prototype standard security suites for delivery to Naval commands, bases, and afloat platforms. Support the design of situational awareness and visualization capabilities to support active computer network defense and

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Exhibit R-2, RDT&E,N Budget Item Justification

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EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303140N

PROGRAM ELEMENT TITLE: Information Systems Security Program

the development of a sensor grid, with underlying data mining and correlation tools. Prototype components and standard security suites at selected operational sites.

- (U) (\$2,100) Provide systems security engineering, C&A support to Navy information system developments such as GCCS-M, GCCS, DMS, ADNS, IT-21, NMCI, NSSL, LPD-17, SCN-21, and others to ensure that security is integrated as early in the development process as possible. Work with application and system developers across Navy system commands to implement security policies, architectures, and components during early stages of design. Focus on integration of the proper functions to ensure adherence to the common security architectures. Ensure that the security and performance of the tactical systems, including those operating at Top Secret and SCI are consistent with Navy and DOD requirements.
- (U) (\$825) Continue developing and updating INFOSEC standards and engineering guidance documents to ensure they are consistent with the security architecture, the rapidly changing technology, and the evolving threat. Focus on the development of security procedures associated with standard network security suites and tools.
- (U) (\$1,265) Develop, prototype, and test solutions to the coalition interoperability problem. Base the solutions on available multilevel security technologies as well as emerging architectural methods of providing interoperability across different security levels.
- (U) (\$1,260) Continue vulnerability/threat assessments and development and systems integration of network countermeasures tools (NVACM) efforts.

3. (U) FY 2001 PLAN:

(U) (\$2,000) Continue development of the digital modular cryptographic solution based on multi-channel, programmable technology (e.g., AIM, CORNFIELD). Begin prototyping candidate cryptographic replacement solutions for evaluation and assessment in representative Navy platforms. Demonstrate digital modular crypto solution at selected operational locations and platforms to illustrate benefits and capabilities. Support the COMSEC certification process, including the conduct of analyses required and the development of associated documentation. These efforts will be fully coordinated with the NSA.

(U) (\$2,533) Complete the development of EKMS Phase IV for Tier 1, Tier 2 and Tier 3. Continue to research and investigate new key management technologies. Demonstrate web-based technology and KSO exchange capabilities. Demonstrate integration of certificate management and key management directory structures and workstation functions.

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Exhibit R-2, RDT&E,N Budget Item Justification

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EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303140N

PROGRAM ELEMENT TITLE: Information Systems Security Program

Demonstrate prototype of the NSPC<sup>2</sup>K design and solution for Navy platforms. Continue to support development of the DTD 2000, and continue to provide key management support for embedded cryptographic technology and cryptographic replacement efforts. Conduct laboratory assessments of the latest NSA and industry COTS key management technology and products. Provide system security and C&A engineering and testing for key management components and systems.

(U) (\$3,036) Continue the design, development, evaluation and application of public key and certificate management infrastructure technologies and systems to support DoD and DON initiatives, including integration with IT-21/NMCI initiatives. Continue to assess the use and application of medium and high assurance commercial products for PKI/CMI applications, including integrating key management and certificate management infrastructures. Continue to work closely with the commercial developers and vendors, infuse technology and requirements into the commercial products, and support efforts to PKI-enable specific applications. Continue to evaluate, assess, integrate and demonstrate related technologies including smart card security tokens and virtual private networks (VPNs). Assess the potential application of biometric access control tokens (fingerprint, voiceprint, iris) and the evaluation/development of electronic commerce applications to more efficiently perform Navy business functions using PKI technologies.

(U) (\$2,000) Continue the design, development and assessment of security solutions/capabilities for next generation voice systems. Continue to examine ways to integrate secure voice, video, and data capabilities over IP and ATM networks. Demonstrate secure voice server IP conversion capabilities to interoperate with legacy equipment. Continue research into new secure voice technology, developing technology and techniques for secure voice over government and commercial communications backbones, specifically addressing wireline/wireless telephony and network applications applicable to strategic and tactical communications. Continue to develop and assess the technology for low data rate algorithms, voice compression technology in conjunction with cryptographic algorithm technology, and voice/speaker recognition. Continue to assess the application of digital cellular and satellite secure voice technology.

(U) (\$1,000) Continue development of Secure Voice-21 (SV-21). This includes the development and integration of the crypto gateways (i.e., network interface card, crypto interface card, and the voice processing card), crypto replacement technology, the NSPC<sup>2</sup>K technology to support the embedded crypto replacements, and new voice algorithms (e.g., Mixed Excitation Linear Prediction (MELP)). Demonstrate the SV-21 suite capability on a new ship operational platform for test and evaluation purposes.

(U) (\$250) Continue to support secure voice and biometric access consortia. Continue laboratory assessments of the latest NSA and industry INFOSEC technology and demonstrations of prototype voice systems. Continue research into new high assurance secure voice technology.

(U) (\$750) Continue the evolutionary development of security architectures for IA that include virtually all Navy distributed information system development programs. Ensure the architectures evolve to provide proper protection as

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Exhibit R-2, RDT&E,N Budget Item Justification

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EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303140N

PROGRAM ELEMENT TITLE: Information Systems Security Program

technology, DOD missions, and the threat all evolve. Provide inputs to the major Navy and joint initiatives that are defining and building distributed systems including IT-21, NMCI, the Joint Technical Architecture, and large development programs including GCCS-M, GCCS, DMS, ADNS, BLII and others. Include both defensive protections as well as intrusion monitoring in the architecture.

(U) (\$4,500) Continue developing and testing distributed information system security solutions for Navy information systems. This includes the examination and selection of next generation networking components required by the architectures that may include firewalls, intrusion detection systems (including host-based systems), virtual private networking systems, public key based secure e-mail and web systems, operating systems and others as well as high assurance components for connection of Top Secret and SCI systems to lower level systems. Examine, evaluate, and demonstrate next generation network security appliances, specifically focusing on increasing performance rates to OC-12 and greater. Continue to support the design of situational awareness and visualization capabilities to support active computer network defense and the development of a sensor grid, with underlying data mining and correlation tools. Develop capability to remotely manage and securely control the configurations of network security components to implement changes in real time or near real time. Continue to prototype components at selected operational sites.

(U) (\$2,500) Provide systems security engineering, C&A support to Navy information system developments such as GCCS-M, GCCS, DMS, ADNS, IT-21, NMCI, NSN, LPD-17, SCN-21, and others to ensure that security is integrated as early in the development process as possible. Work with application and system developers across Navy system commands to implement security policies, architectures, and components during early stages of design. Focus on integration of the proper functions to ensure adherence to the common security architectures. Ensure that the security and performance of the tactical systems, including those operating at Top Secret and at SCI are consistent with Navy and DOD requirements.

(U) (\$461) Continue developing and updating INFOSEC standards and engineering guidance documents to ensure they are consistent with the security architecture, the rapidly changing technology, and the evolving threat. Focus on the development of security procedures associated with next generation network security suites and tools to facilitate rapid transition of these components and tools to the Fleet.

(U) (\$1,500) Continue to design, develop, and prototype coalition interoperability and multi-level security solutions. Base the solutions on available multilevel security technologies as well as emerging architectural methods of providing interoperability across different security levels. Continue to examine multi-level aware applications and technologies including databases, web browsers, routers/switches, etc.

(U) (\$1,000) Continue vulnerability/threat assessments and development and systems integration of network countermeasures tools (NVACM) efforts.

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Exhibit R-2, RDT&E,N Budget Item Justification

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EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303140N

PROGRAM ELEMENT TITLE: Information Systems Security Program

B. (U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) FY 1999: Inflation savings -\$100K. -\$288K transfer for SBIR and -\$401K department adjustment.

(U) FY 2000: -\$124K miscellaneous department adjustments. -\$312K, portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

FY 2001: -\$2,182K miscellaneous department adjustments.

(U) Schedule: Navy's 1<sup>st</sup> Qtr IOC/GAT schedule was impacted due to the establishment of a master integrated EKMS schedule coordinated among NSA and Service representatives which synchronizes the individual EKMS efforts managed by the Navy and NSA. This master integrated schedule was briefed and approved by the Military Communications Electronics Board (MCEB) in October 1999.

(U) Technical: N/A

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL COMPLETE PROGRAM
(U) OPN 3415 Information Systems Security Program (ISSP)									
39,176	66,765	46,563	90,849	60,622	88,225	94,795	CONT.	CONT.	
(U) O&MN 4A6M									
10,942	13,930	25,203	19,233	19,821	17,774	17,819	CONT.	CONT.	
(U) RELATED RDT&E:									
(U) PE 0303140G (Cryptographic Equipments)									

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EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION

DATE: FEB 2000

PROGRAM ELEMENT: 0303140N

PROGRAM ELEMENT TITLE: Information Systems Security Program

BUDGET ACTIVITY: 7

D. ACQUISITION STRATEGY

EKMS

	<u>FY 1999</u>	<u>FY 2000</u>	<u>To Complete</u>
Program Milestones			4Q-Tier 1 IOC
Engineering Milestones	1Q-Build Rev 3		
T&E Milestones	3Q-Tier 1 Test		3Q-Tier 1 Government Acceptance Test (GAT)
Contract Milestones			

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Exhibit R-2, RDT&E,N Budget Item Justification

## UNCLASSIFIED

## EXHIBIT R-3, FY 2001 RDT&amp;E,N PROJECT COST ANALYSIS

DATE: FEB 2000  
PROJECT NUMBER: X0734

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0303140N      PROGRAM ELEMENT TITLE: Information Systems Security Program

Exhibit R-3 Cost Analysis (page 1)					Date: FEB 2000							
APPROPRIATION/BUDGET ACTIVITY: 7			PROGRAM ELEMENT: 0303140N				PROJECT NAME AND NUMBER: ISSP (X0734)					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
HARDWARE DEVELOPMENT	CPFF/	VIASAT	7,282	0		0				0	7,282	7,582
SOFTWARE DEVELOPMENT	CPAF	SAIC	23,366	1,781	12/98	4,450	11/99			0	29,597	37,621
HARDWARE DEVELOPMENT	VAR	MITRE	1,911	532	02/99	1,260	10/99	1,000	10/00	Cont.	Cont.	Cont.
HARDWARE DEVELOPMENT	VAR	VARIOUS	21,876	16,710	VAR	16,394	VAR	20,530	VAR	Cont.	Cont.	Cont.
Subtotal Product Development			54,435	19,023		22,104		21,530		Cont.	Co t.	Cont.
Remarks:												
SAIC target value of contract includes other services' funding.												
SYSTEMS ENGINEERING	VAR	VAR	2,976							0	2,976	2,976
Subtotal Support			2,976							0	2,976	2,976
Remarks												

(Exhibit R-3, page 1 of 2 )

R-1 Shopping List - Item No. 183 - 15 of 183 - 16

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Exhibit R-3, RDT&amp;E,N Project Cost Analysis

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EXHIBIT R-3, FY 2001 RDT&E,N PROJECT COST ANALYSIS

DATE: FEB 2000  
PROJECT NUMBER: X0734

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0303140N  
PROGRAM ELEMENT TITLE: Information Systems Security Program

Exhibit R-3 Cost Analysis (page 2)				Date: FEB 2000								
APPROPRIATION/BUDGET ACTIVITY: 7				PROGRAM ELEMENT: 0303140N				PROJECT NAME AND NUMBER: X0734				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal T&E												
Remarks												
PROGRAM MGMT SUPPORT	VAR	VARIOUS	1,995	1,191	10/98	750	10/99	0		Cont.	Cont.	Cont.
Subtotal Management			1,995	1,191		750		0		Cont.	Cont.	Cont.
Remarks												
Total Cost			59,406	20,214		22,854		21,530		Cont.	Cont.	Cont.

(Exhibit R-3, page 2 of 2)

R-1 Shopping List - Item No. 183 - 16 of 183 - 16

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Exhibit R-3, RDT&E,N Project Cost Analysis



# UNCLASSIFIED

## EXHIBIT R-2a, FY 2001 RDT&E,N PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303150N

PROGRAM ELEMENT TITLE: Global Command and Control System

F(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1999 ACTUAL ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2304 Global Command and Control System (GCCS)	422	0	0	0	0	0	0	0	941
TOTAL	422	0	0	0	0	0	0	0	941

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Global Command and Control System (GCCS) is the DoD's conventional command and control (C2) system that supports the National Command Authority and the Joint Staff in the mission areas of force employment, sustainment, surveillance, reconnaissance and intelligence. Additionally, GCCS supports decision support systems at the Area Air Defense Coordinator (AADC) and Commander, Joint Task Force (CJTF) facilities.

The Defense Information Systems Agency (DISA) is the lead agency for GCCS, however, each Service is responsible for designing and developing essential Service-unique segments in support of their GCCS users. These segments must be interoperable with the GCCS architecture.

The Navy supported GCCS sites are USACOM, USPACOM, CINCLANTFLT, CINCPACFLT, CINCUSNAVEUR, CNO, and COMNAVCENT Bahrain (in FY00) and COMUSJAPAN, as well as associated remote and afloat users. The GCCS funding will transfer to the GCCS-M program beginning in FY2000.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT (BA 7) because it encompasses engineering and manufacturing development for upgrade of existing operational systems.

R-1 Shopping List - Item No 184-1 of 184-3

Exhibit R-2a, RDT&E Project Justification

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# UNCLASSIFIED

## EXHIBIT R-2a, FY 2001 RDT&E,N PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303150N  
PROGRAM ELEMENT TITLE: Global Command and Control System

### (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

#### 1. (U) FY 1999 ACTUAL:

- (U) (\$422) Continued to develop and migrate the Web based interfaces and Navy site unique GCCS applications to GCCS DII version 3.0. Efforts included initial development and required upgrades to Navy segments to accommodate changes between GCCS DII COE versions 2.2 and 3.0. Developed RUDRS and integrated with GCCS DII version 3.0.

#### 2. (U) FY 2000 ESTIMATE: Not Applicable

#### 3. (U) FY 2000 ESTIMATE: Not Applicable

#### 4. (U) FY 2001 ESTIMATE: Not Applicable

### B. (U) PROGRAM CHANGE SUMMARY:

(U) CHANGE SUMMARY EXPLANATION: FY 1999: Congressional reduction for Inflation Savings (-\$2K). SBIR/STTR Transfer (\$-12K), and miscellaneous Departmental adjustments (\$-32K).

R-1 Shopping List - Item No 184-2 of 184-3

Exhibit R-2a, RDT&E Project Justification

# UNCLASSIFIED

# UNCLASSIFIED

## EXHIBIT R-2a, FY 2001 RDT&E,N PROJECT JUSTIFICATION

DATE: FEB 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0303150N

PROGRAM ELEMENT TITLE: Global Command and Control System

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL
ACTUAL ESTIMATE	485	0	0	0	0	0	0	COMPLETE	PROGRAM
(U) OPN 3350	4,864	2,907	2,835	2,917	3,374	3,774	3,435	CONT.	CONT.

\* Beginning in FY00, GCCS OPN transferred to 2804. Only reporting GCCS portion of 2804.

(U) RELATED RDT&E: Not applicable

D. (U) SCHEDULE PROFILE: Not Applicable

R-1 Shopping List - Item No 184-3 of 184-3

Exhibit R-2a, RDT&E Project Justification

# UNCLASSIFIED

# UNCLASSIFIED

DATE: February 2000

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N  
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0524 Navy METOC Support (Space)			17,896	19,783	14,115	18,090	19,507	CONT.	CONT.
X1452 GEOSAT	1,426	1,727	1,834	1,835	1,841	1,081	1,112	CONT.	CONT.
TOTAL	11,755	14,497	19,730	21,618	15,956	19,171	20,619	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element supports Navy interests in meteorological and oceanographic (METOC) remote sensors. These interests include commitments to satellite, sensor, and operational development activities associated with three satellite programs: 1) the Joint Service Defense Meteorological Satellite Program (DMSP), 2) The National Polar-orbiting Operational Environmental Satellite System (NPOESS) and 3) the Navy Geodetic/geophysical Satellite (GEOSAT) program, funded entirely by Navy. The passive microwave instruments carried on DMSP and future NPOESS provide global oceanic and atmospheric data of direct operational relevance, including sea surface wind, sea ice, and precipitation; GEOSAT altimeter data are used to observe significant wave height, ocean fronts and eddies, and internal acoustic structure. The Navy (METOC) Support (Space) project provides for Navy participation in Navy/Air Force cooperative efforts leading to DMSP sensor development, including calibration and validation of instruments and delivery of satellite products to the Fleet. WindSat, an initiative begun in 1997, is a partnered program that meets multiple Naval remote sensing requirements and provides a significant risk reduction for NPOESS, the converged Department of Commerce/National Oceanic and Atmospheric Administration/Department of Defense environmental satellite program. The Navy METOC Support (Space) project supports the Navy contribution to WindSat, which is fully funded via a formalized inter-agency agreement. The NPOESS Integrated Program Office is providing a portion of the funds for the WindSat sensor and the DOD Space Test Program (STP) will fund the satellite bus and provide the launch vehicle. The GEOSAT provided ocean topography information from 1985-1990. In 1991, the Navy began the development of a follow-on capability to continue providing this required ocean topography information via the GEOSAT Follow-On satellite, launched on 10 February 1998. Both the GEOSAT and Navy METOC (Space) projects fulfill Navy's obligation to develop Navy-unique, mission critical Space-based METOC technology.

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Budget Item Justification  
(Exhibit R-2, page 1 of 13)

# UNCLASSIFIED

# UNCLASSIFIED

DATE: February 2000

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N  
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

## B. (U) PROGRAM CHANGE SUMMARY FOR TOTAL PE:

	FY 1999	FY 2000	FY 2001
(U) FY 2000 President's Budget:	11,614	14,507	19,127
(U) Appropriated Value	-	14,507	-
(U) Adjustment from PRESBUDG:	-	-	-
(U) SBIR/STTR:	-47	-	-
(U) Inflation Adjustment	-53	-	-
(U) Congressional Recissions	-	-10	-
(U) Execution Adjustment:	+241	-	-
(U) Various Rate Adjustments	-	-	-715
(U) SSP Adjustment	-	-	-2
(U) Program Adjustments:	-	-	+1,320
(U) FY 2001 President's Submission	11,755	14,497	19,730

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Budget Item Justification  
(Exhibit R-2, page 2 of 13)

# UNCLASSIFIED

# UNCLASSIFIED

DATE: February 2000

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N  
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0524 Navy (METOC) Support (Space)	10,329	12,770	17,896	19,783	14,115	18,090	19,507	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Navy Meteorological and Oceanographic Sensor-Space (METOC)-Navy (METOC) Support (Space) project provides for Navy participation in Defense Meteorological Satellite (DMSP) Special Sensor Microwave/Imager (SSM/I) and Special Sensor Microwave Imager/Sounder (SSM/IS) calibration efforts, and future Navy-unique sensor development efforts (Windsat) in support of the Fleet operational requirements. The project ensures Navy operational requirements are satisfied primarily through demonstration of technologies for inclusion on operational constellations such as DMSP and the National Polar-orbiting Operational Environmental Satellite System (NPOESS). These efforts fulfill Navy unique requirements that are not funded within the DMSP and NPOESS programs, and are in accordance with current inter-agency agreements. The project acquires information necessary to keep Navy ground receiving equipment compatible with future satellite data formats and data transfer rates. The project also provides for studies leading to operational improvements of satellite derived products and Navy participation as a voting member of the DMSP Configuration Control Board (CCB). Future funding plans respond to emerging Chief of Naval Operations requirements for Navy METOC data. Plans for FY 2002 and beyond address the requirement for high-resolution METOC imagery to ships, in particular the Indian Ocean and Arabian Gulf region.

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Budget Item Justification  
(Exhibit R-2, page 3 of 13)

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FY 2001 RDT&E,N PE/PROJECT COST BREAKDOWN

DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT:

0305160N

PROJECT NUMBER: R0524

PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic  
Sensors-Space (METOC)

PROJECT TITLE: Navy METOC  
Support (Space)

## B. (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

### 1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) (495k) Participated in DMSP Special Sensor Microwave/Imager (SSM/I) calibration and validation. Continued data quality assurance activities in support of operational products.
- (U) (1,143k) Completed the design and began fabrications of Airborne Polarimetric Microwave Imaging Radiometer (APMIR) to use for calibration/validation of DMSP SSM/I, and SSM/IS, and WindSat development, calibration, and validation.
- (U) (8,691k) Completed critical design and analysis for WindSat and breadboard component and subsystem testing leading to prototype instrument validation and a manufacturing readiness review. Initiated development of algorithms and ground software for the delivery of environmental data records for use with WindSat Data.

### 2. (U) FY 2000 PLAN:

- (U) (765k) Conduct SSM/I calibration and validation. Prepare for validation effort associated with the expected launch of the first DMSP SSM/IS.
- (U) (425k) Complete the fabrication, integration, and flight testing of Airborne Polarimetric Microwave Imaging Radiometer (APMIR) to use for calibration/validation of DMSP SSM/I and SSM/IS sensors, and WindSat development, calibration, and validation.
- (U) (11,580k) Continue WindSat sensor development and initiate fabrication of flight hardware components and subsystems. Continue support of spacecraft development effort. Continue development of algorithms and ground software for WindSat environmental data records.

### 3. (U) FY 2001 PLAN:

- (U) (900k) Continue to monitor SSM/I performance and continue validation effort associated with the DMSP SSM/IS.
- (U) (16,708k) Complete final WindSat sensor integration and flight hardware testing. Integrate WindSat flight sensor with Coriolis spacecraft. Conduct full space system testing including environmental testing. Complete development and testing of algorithms and ground software for WindSat environmental data records. Prepare for WindSat launch processing, launch operations, flight operations, calibration and validation.

R-1 Line Item 186

Budget Item Justification  
(Exhibit R-2, page 4 of 13)

# UNCLASSIFIED

# UNCLASSIFIED

FY 2001 RDT&E,N PE/PROJECT COST BREAKDOWN DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: R0524  
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic PROJECT TITLE: Navy METOC  
Sensors-Space (METOC) Support (Space)

(U) (288k) Conduct field experiments with APMIR to use for calibration/validation of DMSP SSM/I and SSM/IS sensors, and prepare for calibration/validation of the Windsat sensor.

B. (U) PROGRAM CHANGE SUMMARY: See total program change summary for P. E.

C. (U) OTHER PROGRAM FUNDING SUMMARY: DOC/NOAA Appropriation Procurement, Acquisition, and Construction, Polar Convergence.

## (U)RELATED RDT&E:

- (U) PE 0603434F Air Force, NPOESS
- (U) PE 0605864F, Air Force, DOD STP
- (U) PE 0305160F, Air Force DMSP
- (U) PE 0604218N, Air/Ocean Equipment Engineering

D. (U) SCHEDULE PROFILE: Not applicable.

R-1 Line Item 186

Budget Item Justification  
(Exhibit R-2, page 5 of 13)

# UNCLASSIFIED



# UNCLASSIFIED

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0305160N      DATE: February 2000  
 PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic      PROJECT NUMBER: R0524  
 Sensors-Space (METOC)      PROJECT TITLE: Navy METOC Support (Space)

## A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	FY 1999	FY 2000	FY 2001
a. Satellite Development	0	2,300	7,740
b. Payload Development	8,691	9,280	8,968
c. Science and Calibration/Validation	495	765	900
d. Airborne Testbed	1,143	425	288
e. Support GFO	0	0	0
Total	10,329	12,770	17,896

## B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Contract

R-1 Line Item 186

PE/Project Cost Breakdown  
 (Exhibit R-3, page 6 of 13)

# UNCLASSIFIED

# UNCLASSIFIED

DATE: February 2000

FY 2001 RDT&E,N PE/PROJECT COST BREAKDOWN

PROJECT NUMBER: R0524  
PROJECT TITLE: Navy METOC Support (Space)

PROGRAM ELEMENT: 0305160N  
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

BUDGET ACTIVITY: 7

Government Performing Activity	Method Fund Vehicle	Award/Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1999 Budget	FY 2000 Budget	FY 2001 Budget	To Complete	Total Program
Product Development Misc.		N/A	CONT.	CONT.	8,691	11,580	16,708	CONT.	CONT.
Support and Management Misc.		N/A	CONT.	CONT.	0	0	0	924	924
Test and Evaluation Misc.		N/A	CONT.	CONT.	1,638	1,190	1,188	CONT.	CONT.
TOTAL:					10,329	12,770	17,896	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not Applicable

	FY 1999 Budget	FY 2000 Budget	FY 2001 Budget	To Complete	Total Program
Subtotal Product Development	10,329	12,770	17,896	CONT.	CONT.
Subtotal Support and Management:	0	0	0	0	0
Subtotal Test and Evaluation:	0	0	0	0	0
Total Project	10,329	12,770	17,896	CONT.	CONT.

R-1 Line Item 186

PE/Project Cost Breakdown  
(Exhibit R-3, page 7 of 13)

# UNCLASSIFIED

# UNCLASSIFIED

DATE: February 2000

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N  
 PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

(U) COST (Dollars in thousands)

PROJECT NUMBER & Title	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
X1452 GEOSAT	1,426	1,727	1,834	1,835	1,841	1,081	1,112	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides a satellite-borne radar altimeter sensor to obtain ocean topography measurements from which tactically significant features such as ocean fronts, and eddies, wave heights, internal acoustic structure, and sea-ice edges are derived. Topography provides a unique and important data source in support of a number of Naval warfare areas such as anti-submarine and undersea warfare. It also provides other agencies, such as National Oceanic and Atmospheric Administration and National Aeronautics and Space Administration with valuable inputs to studies involving Pacific Ocean temperature oscillations, global warming and climate change. Ocean topography data was previously provided by GEOSAT from 1985 until the satellite failed in January 1990. The GEOSAT Follow-On (GFO) satellite provides altimetry data until altimetry data becomes available from a future national environmental satellite system.

R-1 Line Item 186

Budget Item Justification  
 (Exhibit R-2, page 8 of 13)

# UNCLASSIFIED

# UNCLASSIFIED

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT:

0305160N

PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic  
Sensors-Space (METOC)

PROJECT NUMBER: X1452  
PROJECT TITLE: GEOSAT

## (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

### 1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) (1,076k) Conducted pre-acceptance operations and satellite anomaly resolution.
- (U) (350k) Conducted altimeter calibration/validation activities.

### 2. (U) FY 2000 PLAN:

- (U) (800k) Fund on-orbit performance incentive.
- (U) (360k) Develop improved ground station satellite data processing techniques.
- (U) (567k) Continue to assess on-orbit system performance, conduct payload calibration/validation and resolve performance anomalies.

### 3. (U) FY 2001 PLAN:

- (U) (800k) Fund on-orbit performance incentive.
- (U) (365k) Develop improved ground station satellite data processing techniques.
- (U) (669k) Continue to assess on-orbit system performance, conduct payload calibration/validation and resolve performance anomalies.

R-1 Line Item 186

Budget Item Justification  
(Exhibit R-2, page 9 of 13)

# UNCLASSIFIED

UNCLASSIFIED

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N

PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic  
Sensors-Space (METOC)

PROJECT NUMBER: X1452  
PROJECT TITLE: GEOSAT

B (U) PROGRAM CHANGE SUMMARY: See Program change summary for total P.E.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:  
(U) PE 0604218N (Air/Ocean Equipment Engineering)

D. (U) SCHEDULE PROFILE:

	FY 1999	FY 2000	FY 2001
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Program  
Milestones

Engineering  
Milestones

T&E  
Milestones

Contract  
Milestones Not Applicable

On orbit tests	On orbit tests	On orbit tests
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R-1 Line Item 186

Budget Item Justification  
(Exhibit R-2, page 10 of 13)

UNCLASSIFIED

# UNCLASSIFIED

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N

PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

PROJECT NUMBER: X1452  
PROJECT TITLE: GEOSAT

## A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories		FY 1999	FY 2000	FY 2001
a.	Satellite Development	1,426	1,727	1,834
b.	Sensor Development	0	0	0
c.	Contractor Engineering Support	0	0	0
Total		1,426	1,727	1,834

## B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

### PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method Fund Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1999 Actual	FY 2000 Budget	FY 2001 Budget	To Complete Program
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### Product Development

Ball Aerospace CPIX 8/92 85,213 85,213 519 950 965 CONT. CONT.

Various Various N/A CONT. 907 777 869 CONT. CONT.

Support and Management: Not Applicable

Contractor/ Contract

R-1 Line Item 186

PE/Project Cost Breakdown  
(Exhibit R-3, page 11 of 13)

# UNCLASSIFIED

# UNCLASSIFIED

DATE: February 2000

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N

PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

PROJECT NUMBER: X1452  
PROJECT TITLE: GEOSAT

Government Performing Activity	Method Fund	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1999 Actual	FY 2000 Budget	FY 2001 Budget	To Complete	Total Program
Various					0	0	0	CONT.	CONT.

Test and Evaluation: Not Applicable

GOVERNMENT FURNISHED PROPERTY Not Applicable

	FY 1999 Actual	FY 2000 Budget	FY 2001 Budget	To Complete	Total Program
Subtotal Product Development	1,426	1,727	1,834	CONT.	CONT.
Subtotal Support and Management	0	0	0	CONT.	CONT.
Subtotal Test and Evaluation Not Applicable					
Total Project	1,426	1,727	1,834	CONT.	CONT.

R-1 Line Item 186

PE/Project Cost Breakdown  
(Exhibit R-3, page 12 of 13)

# UNCLASSIFIED

# UNCLASSIFIED

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT:

0305160N

PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic  
Sensors-Space (METOC)

PROJECT NUMBER: X1452  
PROJECT TITLE: GEOSAT

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R-1 Line Item 186

PE/Project Cost Breakdown  
(Exhibit R-3, page 13 of 13)

# UNCLASSIFIED



UNCLASSIFIED

EXHIBIT R-2, FY2001 RDT&E,N Budget Item Justification DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305188N PROJECT NUMBER: X2456  
PROGRAM ELEMENT TITLE: Joint (C4ISR) Battle Center

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1999 ACTUAL	FY 2000 ACTUAL	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2456 Joint (C4ISR) Battle Center	5,143	8,081	7,795	8,396	8,603	8,783	9,090	CONT.	CONT.
TOTAL	5,143	8,081	7,795	8,396	8,603	8,783	9,090	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Joint Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Battle Center (JBC) is the Commander In Chief, United States Atlantic Command (CINUSACOM) and Chairman, Joint Chiefs of Staff (CJCS) facility for warfighter exploration and assessment of C4ISR capabilities. The Center provides the combatant commands, at the Joint Task Force (JTF) level, with a near term joint assessment and experimental environment for the warfighter and technologist in support of Joint Vision 2010 (JV2010). It serves as the technical analysis and assessment agency for the Joint Requirement Operating Council (JROC) in determining C4ISR system "value-added" PRIOR to introduction to the CINCs and in advance of system fielding in operational environments. The intent is for the JBC to be a forcing function for joint synchronization and a means to foster rapid, near-term insertion of C4ISR technology. The mission of the JBC is to provide rapid assessment of required C4ISR interoperability and warfighter utility, join emerging C4ISR technology with new operational doctrine, and result in fielding C4ISR capabilities that meet the joint warfighter's needs.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it provides rapid assessment of required C4ISR interoperability, as well as rapid insertion of emerging technology, with new operational doctrine that will result in fielding C4ISR capabilities that meet the joint warfighter's need.

Program Budget Decision (PBD) 710, Defense Reform Initiative, moved the JBC from the Joint Staff to CINUSACOM with funding moved to the Department of Navy, as Executive Agent for CINUSACOM, effective FY 99. FY 97 and FY 98 funds are reflected in the Joint Staff RDT&E,N budget submission.

R-1 Shopping List - 187-1 of 187-8

UNCLASSIFIED

Exhibit R-2, RDT&E,N Budget Item Justification

UNCLASSIFIED

EXHIBIT R-2, FY2001 RDT&E,N Budget Item Justification      DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0305188N      PROJECT NUMBER: X2456  
PROGRAM ELEMENT TITLE: Joint (C4ISR) Battle Center

B. (U) PROGRAM CHANGE SUMMARY:

FY 1999: SBIR/STTR Transfer (-124K), LOCO-GPSI Reprogramming (-45K), Sec 8090 Inflation (-24), FY 1999 Funds Reprogrammed outside of SPAWAR (-1).

FY 2000: Congressional Reduction (-44K), \$105K Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

FY 2001: SSP Contract Reduction (-8), Low Expenditure Rate (-413), NWCF Rates - NCCOSC (-2), ICC 0614 SPAWAR Program Adjustment (+1), Non-Pay Purchase Inflation (-66), Active Navy Ops (-20).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) (\$1,450K) Follow-on JWID. Upon completion and evaluation of each theme year JWID theCINC's and CJTF's involved identify systems which demonstrated warfighting utility but which require further refinement and follow-on assessment. These technologies are forwarded to the JBC for inclusion in the exploitation fiscal year plan. Enhancements and follow-on assessments were conducted by JBC and programmatic recommendations were prepared.
- (U) (\$1,100K) Asynchronous Transfer Mode (ATM) Operational Demonstration. ATM had taken advantage of significant advances in switching technology to ensure CJTF seamless communications across all forces. Bandwidth restrictions severely limit successful JTF operations. ATM offers a potential solution but there is currently no DOD or Industry standard. This effort addressed a lack of commonality among the services in their communications approaches and addresses synchronization disconnects relating to fielding schedules which affect the required CINC/JTF capability. Each service is currently selecting their "vendor of choice" which will likely lead to non-interoperability as well as increased cost and complexity in implementation. JBC continued to document/validate interoperability problems, assess ability to support tactical JTF down to actual ground forces and perform an operational demonstration.
- (U) (\$1,007K) Link 16 Operational Demonstration. Demonstrated Link-16/VMF Digitized Battle Space interoperability through proof of concept prototype development to permit portable exchange

R-1 Shopping List - 187-2 of 187-8

UNCLASSIFIED

Exhibit R-2, RDT&E,N Budget Item Justification

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EXHIBIT R-2, FY2001 RDT&E,N Budget Item Justification      DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0305188N      PROJECT NUMBER: X2456  
PROGRAM ELEMENT TITLE: Joint (C4ISR) Battle Center

of tactical information to/from Link-16 and VMF networks. This was an advanced concept technology demonstration (ACTD).

- (U) (\$1,586K) Federated Battle Lab (FBL). The FBL is a consortium of Joint and Service battle centers/laboratories formed to promote solutions to operational problems in CJTF environments. The JBC is recognized as the joint FBL hub by CINC's, services, agencies and CJTF's. The JBC, as chairman of the consortium, coordinated efforts to capitalize on lessons learned in order to continue these effective and successful collaborative experiments in future years.

2. (U) FY 2000 PLAN:

- (U) (\$1,505K) Follow-on JWID. Upon completion and evaluation of each theme year JWID theCINC's and CJTF's involved identify systems which demonstrated warfighting utility but which require further refinement and follow-on assessment. These technologies are forwarded to the JBC for inclusion in the exploitation fiscal year plan. Enhancements and follow-on assessments are conducted by JBC and programmatic recommendations are prepared.
- (U) (\$1,842K) Federated Battle Lab (FBL). The FBL is a consortium of Joint and Service battle centers/laboratories formed to promote solutions to operational problems in CJTF environments. The JBC is recognized as the joint FBL hub by CINC's, services, agencies and CJTF's. The JBC, as chairman of the consortium, will coordinate efforts to capitalize on lessons learned in order to continue these effective and successful collaborative experiments in future years.
- (U) (\$1,390K) Intelligence, Surveillance and Reconnaissance (ISR). The JBC, as written into the Joint Intelligence Interoperability Board (JIIB), will perform system integration and functional assessments of the identified intelligence systems, including shared segments, as appropriate. JBC will establish and maintain a JTF Integration Facility (JTFIF) to include current and BETA baselines of all the major Service ISR systems to support on-going maturity, operational utility, and jointness assessments of ISR systems.

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Exhibit R-2, RDT&E,N Budget Item Justification

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EXHIBIT R-2, FY2001 RDT&E,N Budget Item Justification      DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305188N

PROGRAM ELEMENT TITLE: Joint (C4ISR) Battle Center

PROJECT NUMBER: X2456

- (U) (\$1,251K) Information Assurance (IA). JBC will continue to be a key player in IA Tools integration with network management and for emerging network IA technologies. JBC will incorporate red-teaming into Joint exercises and FBL efforts in order to facilitate JBC assessments of new C4ISR IA technologies. JBC will also be looking at Information Operations Planning Tools that provide analysis, correlation, and fusion capabilities as well as greater visualization, rehearsal, and wargaming/situational analysis capabilities.
- (U) (\$637K) MILSATCOM. JBC will be a host site for the Global Broadcast System (GBS) Test Bed/GBS Receive Suite. Included in this effort will be the installation of a GBS receive suite at the JBC and the associated program plan to move the Phase I GBS Test Bed equipment to the JBC from the Pentagon. The JBC will be involved in joint evaluation of system applications for various MILSATCOM initiatives as they are developed, thereby assuring that they will be "born joint."
- (U) (\$1,456K) Joint C4ISR Operational Architectures. The focus of Joint Operational Architectures is on C4ISR support to the warfighter across the "Range of Military Operations." The objective is to describe the doctrinally based tasks and activities, operational elements, and the time phased information flows required to accomplish Joint military operations. The architectures will be used to assess and analyze doctrine, TTPs, system and procedural interoperability, processes, and synchronization issues that impact Joint Forces. These Operational Architectures will provide the baseline to identify warfighter requirements, design and structure assessments, and generate functional metrics. They will be developed and documented in close coordination with OSD, Joint staff, CINCs, and Services.

3. (U) FY 2001 PLAN:

- (\$1,570K) Follow-on JWID. Upon completion and evaluation of each theme year JWID theCINC's and CJTF's involved identify systems which demonstrated warfighting utility but which require further refinement and follow-on assessment. These technologies are forwarded to the JBC for inclusion in the exploitation fiscal year plan. Enhancements and follow-on assessments are conducted by JBC and programmatic recommendations are prepared.
- (U) (\$1,921K) Federated Battle Lab (FBL). The FBL is a consortium of Joint and Service battle centers/laboratories formed to promote solutions to operational problems in CJTF environments. The JBC is recognized as the joint FBL hub by CINC's, services, agencies and CJTF's. The JBC, as

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UNCLASSIFIED

Exhibit R-2, RDT&E,N Budget Item Justification

UNCLASSIFIED

EXHIBIT R-2, FY2001 RDT&E,N Budget Item Justification      DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305188N

PROGRAM ELEMENT TITLE: Joint (C4ISR) Battle Center

PROJECT NUMBER: X2456

chairman of the consortium, will coordinate efforts to capitalize on lessons learned in order to continue these effective and successful collaborative experiments in future years.

- (U) (\$1,407K) Intelligence, Surveillance and Reconnaissance (ISR). The JBC, as written into the Joint Intelligence Interoperability Board (JIIB), will perform system integration and functional assessments of the identified intelligence systems, including shared segments, as appropriate. JBC will establish and maintain a JTF Integration Facility (JTJFIF) to include current and BETA baselines of all the major Service ISR systems to support on-going maturity, operational utility, and jointness assessments of ISR systems.
- (U) (\$1,348K) Information Assurance (IA). JBC will continue to be a key player in IA Tools integration with network management and for emerging network IA technologies. JBC will incorporate red-teaming into Joint exercises and FBL efforts in order to facilitate JBC assessments of new C4ISR IA technologies. JBC will also be looking at Information Operations Planning Tools that provide analysis, correlation, and fusion capabilities as well as greater visualization, rehearsal, and wargaming/situational analysis capabilities.
- (U) (\$657K) MILSATCOM. JBC will be a host site for the Global Broadcast System (GBS) Test Bed/GBS Receive Suite. Included in this effort will be the installation of a GBS receive suite at the JBC and the associated program plan to move the Phase I GBS Test Bed equipment to the JBC from the Pentagon. The JBC will be involved in joint evaluation of system applications for various MILSATCOM initiatives as they are developed, thereby assuring that they will be "Born Joint."
- (U) (\$892K) Joint C4ISR Operational Architectures. The focus of Joint Operational Architectures is on C4ISR support to the warfighter across the "Range of Military Operations." The objective is to describe the doctrinally based tasks and activities, operational elements, and the time phased information flows required to accomplish Joint military operations. The architectures will be used to assess and analyze doctrine, TTPs, system and procedural interoperability, processes, and synchronization issues that impact Joint Forces. These Operational Architectures will provide the baseline to identify warfighter requirements, design and structure assessments, and generate functional metrics. They will be developed and documented in close coordination with OSD, Joint staff, CINCs, and Services.

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Exhibit R-2, RDT&E,N Budget Item Justification

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EXHIBIT R-2, FY2001 RDT&E,N Budget Item Justification DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305188N PROJECT NUMBER: X2456  
PROGRAM ELEMENT TITLE: Joint (C4ISR) Battle Center

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL
ACTUAL ESTIMATE	2,677	0	0	0	0	0	0	0	2,677
(U) OMN 1C6C	10,071	12,456	12,730	13,009	13,296	13,296	13,296	Cont	Cont

D. (U) ACQUISITION STRATEGY

- FY 1998-01. The JBC does not have a major contract for its RDT&E efforts. Equipments that are required to support our various projects are either bought from other service contracts and/or from the GSA schedule. Services are provided by other services and/or various vendors with expertise on a specific assessment we are accomplishing.

## UNCLASSIFIED

EXHIBIT R-3, FY 2001 RDT&amp;E,N PROJECT COST ANALYSIS

DATE: Feb 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305188N

PROGRAM ELEMENT TITLE: Joint (C4ISR) Battle Center

Exhibit R-3 Cost Analysis (page 1)										Date: FEB 2000		
APPROPRIATION/BUDGET ACTIVITY				1319/BA 7		PROGRAM ELEMENT: 0305188N				PROJECT NAME AND NUMBER: JBC/X2456		
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Dev Support Equip Acquisition	MIPR	GSA Schedule		244	Var	405	Var	392	Var	Cont	Cont	Cont
Systems Engineering	C-CPFF	ODU		126	12/98	129	11/99	132	10/00	Cont	Cont	Cont
Development T & E	MIPR	MITRE		450	12/98						450	450
Government Engineering Supt	MIPR	Various DoD		302	3/99	1240	2/00	1196	10/00	Cont	Cont	Cont
Subtotal Product Development				1122		1774		1720		Cont	Cont	Cont
Remarks:												
Systems Engineering	C-CPFF	ODU		102	12/98	104	11/99	106	10/00	Cont	Cont	Cont
Contractor Engineering Supt	C-CPFF	GTE		579	12/98						579	579
Government Engineering Supt	MIPR	Various DoD		203	3/99	1234	2/00	1148	10/00	Cont	Cont	Cont
Subtotal Support				884		1338		1254		Cont	Cont	Cont
Remarks												

R-1 Shopping List - Item No 187-7 of 187-8

UNCLASSIFIED

Exhibit R-3, Project Cost Analysis

## UNCLASSIFIED

EXHIBIT R-3, FY 2001 RDT&amp;E,N PROJECT COST ANALYSIS

DATE: Feb 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305188N

PROGRAM ELEMENT TITLE: Joint (C4ISR) Battle Center

Exhibit R-3 Cost Analysis (page 2)												Date: FEB 2000	
APPROPRIATION/BUDGET ACTIVITY: 1319/BA 7				PROGRAM ELEMENT: 0305188				PROJECT NAME AND NUMBER: JBC/X2456					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract	
Dev Support Equipment Acq	MIPR	GSA Schedule		317	Var 12/98	802	Var 11/99	770	Var 10/00	Cont	Cont	Cont	
Systems Engineering	C-CPFF	ODU		239	4/99	241	11/99	246	10/00	Cont	Cont	Cont	
Contractor Engineering Support	C-CPFF	GTE		1175	2/99	3926	2/00	3805	10/00	Cont	1175	1175	
Gov Engineering Support	MIPR(s)	Various DoD		1406						Cont	Cont	Cont	
Subtotal T&E				3137		4969		4821		Cont	Cont	Cont	
Remarks													
Subtotal Management													
Remarks													
Total Cost				5143		8081		7795		Cont	Cont	Cont	
Remarks													

R-1 Shopping List - Item No 187-8 of 187-8

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Exhibit R-3, Project Cost Analysis



**UNCLASSIFIED**  
**EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
A2478 Tactical Control Station	31,925*	27,401***	41,378***	18,954	9,245	9,386	9,582	CONT.	CONT.
A2479 Applied Technology (AT)	8,986*	9,647**	7,832	7,335	7,914	8,084	8,292	CONT.	CONT.
A2671 Multiple Participant Competitive Demonstration	9,932	0	0	0	0	0	0	0	9,932
A2768 VTUAV (formerly VTOL UAV A2467) Quantity of RDT&E Articles	0	38,277	63,842	48,478	19,422	0	0	0	170,019
<b>TOTAL</b>	<b>50,843</b>	<b>75,325</b>	<b>113,052</b>	<b>74,767</b>	<b>36,581</b>	<b>17,470</b>	<b>17,874</b>	<b>CONT.</b>	<b>CONT.</b>

\* The FY99 budget reflects a \$32,144K Congressional add for the Tactical Control Station (A2478) executed under A2669, which has been revised by \$74K for Congressional undistributed adjustments and \$145K for Inflation Savings. The FY99 budget reflects a \$5,048K Congressional transfer from the Defense Airborne Reconnaissance Office (DARO) for AT (A2479) executed under A2668, which has been revised by \$12K for Congressional undistributed adjustments and \$23K for Inflation savings. The FY99 budget reflects a \$4,000K Congressional add for the multi-function self aligned gate array technology (A2479) executed under A2670, which has been revised by \$9K for Congressional undistributed adjustments and \$18K for inflation savings.

\*\* The FY00 Budget reflects a \$3,000K Congressional add for the multi-function self, aligned gate array technology (A2479) will be executed under A2670.

\*\*\* Funding for the Joint Technology Center/Systems Integration Lab is listed under project A2478 for this submission. A new project (A2910) has been created and will be used in future submissions. Funding associated with the JTC/SIL in A2478 is \$1,500 thousand in FY00 and \$2,300 thousand in FY01.

(U) A.MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program provides for the development of tactical unmanned aerial vehicle (TUAV) systems for DoD that provide warfighters with a dedicated capability for day/night aerial reconnaissance, surveillance and target acquisition (RSTA); intelligence, communications/data dissemination; electronic warfare; weather data collection to support combat operations; minefield detection; and nuclear, biological and chemical reconnaissance in limited adverse weather. Specifically:

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- VTUAV (formerly VTOL UAV): The Vertical Takeoff and Landing Tactical Unmanned Aerial Vehicle (VTUAV) will provide users real-time and near-real-time data required to support intelligence surveillance and reconnaissance (ISR) efforts without the use of manned aircraft or reliance on limited joint theater or national assets. Missions supported under ISR and accomplished by a VTUAV include over-the-horizon classification and targeting, mine countermeasures, battle management, chemical/biological agent reconnaissance and signals intelligence. The VTUAV would be an organic asset of the ship to which it is attached or deployed. The forte of the VTUAV is that it launches and recovers vertically and it can operate from any/all air capable ships as well as confined land based areas.

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### EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

(U) COST: (Dollars in Thousands)

Other capabilities of the VTUAV include: autonomous waypoint navigation; automatic launch and recovery of the vehicle both ashore and afloat; incorporation of a heavy fuel engine and the ability to incorporate modular mission payloads. The data from the VTUAV System would be provided to the user through standard DoD Command, Control, Communications, Computers and Intelligence (C4I) systems, architectures and protocols.

- TCS: Efforts are underway to develop a Tactical Control System (TCS) to provide an interoperable capability for control of the Medium Altitude Endurance (MAE) and the spectrum of present and future Tactical UAVs and their payloads utilized by the military services for RSTA and combat assessment. TCS has the objective requirement to interface with the Global Hawk High Altitude Endurance (HAE) UAV system and provide connectivity to service designated C4I systems. TCS is being developed in concert with the development of UAV concepts of operations so as to ensure system functionality satisfies operational requirements. The UAV Joint Technology Center and Systems Integration Laboratory (JTC/SIL) supports Concept of Operations (CONOPS) evaluations using the Multiple UAV Simulation Environment (MUSE) in Advanced Warfighting Exercises (AWEs). TCS development and testing is being accomplished via a Government/Industry Team. Software integration/development was initially the responsibility of Naval Surface Warfare Center (NSWC), Dahlgren Division, while systems integration is being accomplished by Raytheon Systems Company. In completing the program's transition to industry, Raytheon Systems Company will assume total system performance responsibility for all software block developments commencing in FY 2000.
  - AT ((Applied Technology), formerly Common Systems Development (CSD)): AT pursues RDT&E of technology supporting the advancement in Naval VTOL Tactical and Medium Altitude Endurance (MAE) Unmanned Aerial Vehicles (UAVs). The focus of AT's efforts is the integrated use of UAVs in a Joint Task Force but also emphasizes the needs of any task force. AT is involved in the development of smaller, more capable payloads to enhance the UAV's ability to carry multiple modular mission payloads. AT supports the VTUAV Program and moves promising technologies from development into utility assessment by operational users. AT is leading exploration of Naval MAE concepts. The near term focus is on demonstrating concepts of operation that will better define system requirements and support decisions regarding need for organic Naval MAE UAV. AT supports cooperative R&D arrangements with major allies and NATO, providing day-to-day management and policy oversight regarding UAV export control and foreign military sales case management.
  - Multiple-Participant Competitive Demonstration: The Multiple-Participant Competitive Demonstration, known also as the VTOL Demonstration, provides the opportunity to assess the maturity of VTOL UAV technologies, evaluate air vehicle performance, minimize risks in development of VTOL UAVs in the Naval environment and gather lessons learned for future acquisition.
- (U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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Exhibit R-2, RDT&E Budget Item Justification  
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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2478

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: Tactical Control System

(U) COST: (Dollars in thousands)

Project Number & Title	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
A2478 Tactical Control System	31,925*	27,401**	41,378	18,954	9,245	9,386	9,582	CONT.	CONT.
<b>TOTAL</b>	<b>31,925*</b>	<b>27,401**</b>	<b>41,378</b>	<b>18,954</b>	<b>9,245</b>	<b>9,386</b>	<b>9,582</b>	<b>CONT.</b>	<b>CONT.</b>

\* The FY 99 budget reflects a \$32,144K Congressional add for the Tactical Control System executed under A2669, which has been revised by \$219K for Congressional undistributed adjustments.

\*\* The FY 00 budget reflects a \$3,000K Congressional add for the Tactical Control System executed under A2669, which has been revised by \$152K for a Congressional Across-the-Board rescission.

### (U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Tactical Control System (TCS) provides interoperability and commonality for mission planning, command, control, communications, and data dissemination for the current and future family of Tactical and Medium Altitude Endurance (MAE) Unmanned Aerial Vehicles (UAVs). It provides a full range of scaleable UAV capability from passive receipt of air vehicle and payload data to full air vehicle command and control. TCS functionality supports the joint warfighter with the software to receive, process, and disseminate the air vehicle and payload data from two or more different UAV types for reconnaissance, surveillance, and combat assessment. TCS also has an objective requirement to receive and disseminate payload information from the Global Hawk High Altitude endurance UAV. TCS supports seamless integration into the existing Command, Control, Communications Computers and Intelligence (C4I) architecture and interfaces with other manned and unmanned reconnaissance platforms and intelligence systems thereby providing information superiority through cross cueing. TCS maximizes the use of Commercial and Government off-the-shelf (COTS and GOTs) hardware and software whenever possible. TCS software will be interoperable and operate on existing standard service computer platforms and be compliant with the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (ASD(C3I)) Joint Technical Architecture, Distributed Common Ground System (DCGS), Common Imagery Ground/Surface Station (CIGSS), and the United States Imagery Standards, and Defense Information Infrastructure/Common Operating Environment (DII/COE). The Systems Integrator, Raytheon Systems Company supports the assessment of system integration readiness prior to actual flight-testing. The UAV Joint Technology Center and Systems Integration Laboratory (JTC/SIL) supports Concept of Operations (CONOPS) evaluations using the Multiple UAV Simulation Environment (MUSE) in Advanced Warfighting Exercises (AWEs). The NATO Naval Armaments Group, Project 35, has undertaken studies/technical demonstrations to define a common interoperable NATO UAV ground control system architecture. Canada and the United Kingdom have established TCS FMS cases, have procured TCS software/hardware, and are participating in TCS and NATO demonstrations.

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**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0305204N**

**PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles**

**PROJECT NUMBER: A2478**

**PROJECT TITLE: Tactical Control System**

### (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

#### 1. FY 1999 Accomplishments:

- (U) (\$13,251) Matured and refined system design. Conducted critical design review and completed block 0 configuration development. Completed Early Operational Assessment.
- (U) (\$10,110) Initiated transition of system engineering and software development responsibility to Systems Design, Test and Integration (SDTI) contractor.
- (U) (\$3,564) Continued route and payload planning systems integration, continued integration of Common Automatic Recovery System (CARS) into TCS; and supported interoperability tests (i.e. VTOL Technical Demonstration Phase II, TCS/Joint Surveillance Target Attack Radar System (JSTARS) Common Ground Station (CGS) C4I Demonstration).
- (U) (\$5,000) Congressionally directed funding for Multiple UAV Simulation Environment (MUSE) efforts.

#### 2. FY 2000 Plan:

- (U) (\$20,286) Initiate development of TCS Block 1 (TUAV) and Block 2 (VTUAV, Predator Engineering Change Proposal (ECP), Unmanned Aerial Vehicles Common Automatic Recovery System (UCARS) and Tactical Common Data Links (TCDL)) systems
- (U) (\$4,565) Initiate documentation, training and logistics efforts for TCS Block 1 and Block 2 systems
- (U) (\$2,550) Conduct testing of Engineering Development Units (EDUs) #1 and #2 and C4I Certification

#### 3. FY 2001 Plan:

- (U) (\$22,763) Complete development of TCS Block 1 (TUAV) system configuration. Continue development of Block 2 (VTUAV, Predator ECP, UCARS and TC DL) systems
- (U) (\$7,283) Complete documentation, training and logistics efforts for TCS Block 1 configuration. Continue documentation, training, and logistics efforts for Block 2 systems
- (U) (\$9,032) Conduct testing of TCS Block 1 and Block 2 systems
- (U) (2,300) Joint Technology Center/Systems Integration Lab (Multiple UAV Simulation Environment) efforts.

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

PROJECT NUMBER: A2478  
PROJECT TITLE: Tactical Control System

PROGRAM ELEMENT: 0305204N  
PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

BUDGET ACTIVITY: 7

### (U) B. PROGRAM CHANGE SUMMARY

(U) FY 2000 President's Budget:	FY 1999 32,070	FY 2000 24,553	FY 2001 15,724
(U) Appropriated Value:	32,144	24,553	
(U) Adjustments from President's Budget:	-145	+ 2,848	+ 25,654
(U) FY 2001 President's Budget Submit:	31,925	27,401	41,378

### CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1999 reflects a \$145 thousand decrease for Inflation savings. FY 2000 reflects a \$3,000 thousand increase from a Congressional add, offset by a \$152 thousand decrease from an Across-the-Board Congressional reduction. FY 2001 reflects a \$25,654 thousand increase which includes a \$2,300 thousand increase for the Joint Technology Center/System Integration Laboratory(JTC/SIL) Simulation Efforts, a \$30 thousand increase for Military and Civilian Pay, a \$103 thousand increase for Navy Working Capital Fund(NWCF) adjustments, a \$23,680 thousand increase for the integration of TCS into the VTUAV and TUAV programs; and is offset by a \$336 thousand decrease for revised economic assumptions, \$14 thousand decrease for Strategic Sourcing Plan Savings and a \$109 thousand decrease for the reprioritization of requirements within the Navy.

(U) Schedule: The TCS schedule has been changed to reflect program realignment with the Army's TUAV and the Navy/Marine Corps VTUAV programs.

(U) Technical: N/A

(U) C. OTHER PROGRAM FUNDING SUMMARY: Not Applicable.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

**DATE:** February 2000

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0305204N**

**PROGRAM ELEMENT TITLE:** Tactical Unmanned Aerial Vehicles

**PROJECT NUMBER:** A2478

**PROJECT TITLE:** Tactical Control System

**(U) D. ACQUISITION STRATEGY:**

The TCS initial design and development effort will be completed at the end of Program Definition and Risk Reduction phase (Phase I) in the 2Q of FY00; Engineering and Manufacturing Development (EMD) phase (Phase II) begins in 2Q FY00. A major effort during the EMD phase will be the integration of TCS hardware and software components by a SDTI contractor for four EDUs. The SDTI contract was awarded to Raytheon 1Q FY99. Options for Full Rate Production (Phase III) of additional TCS systems will be included in the basic SDTI contract. The scheduled Initial Operational Capability (IOC) and Full Operational Capability (FOC) of TCS will occur as outlined in the current services Tactical and Medium Altitude Endurance UAV systems programs.

**(U) E. SCHEDULE PROFILE**

**(U) Program Milestones**

MS II  
EMD Start  
EDU Delivery  
MS III A (Army)

<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
1	2	3	4	1	2	3	4	1	2	3	4
						X					
					X						
							X				X

**(U) Engineering Milestones**

VTUAV Interoperability  
MAE/TUAV Interoperability

	→
	→

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2478

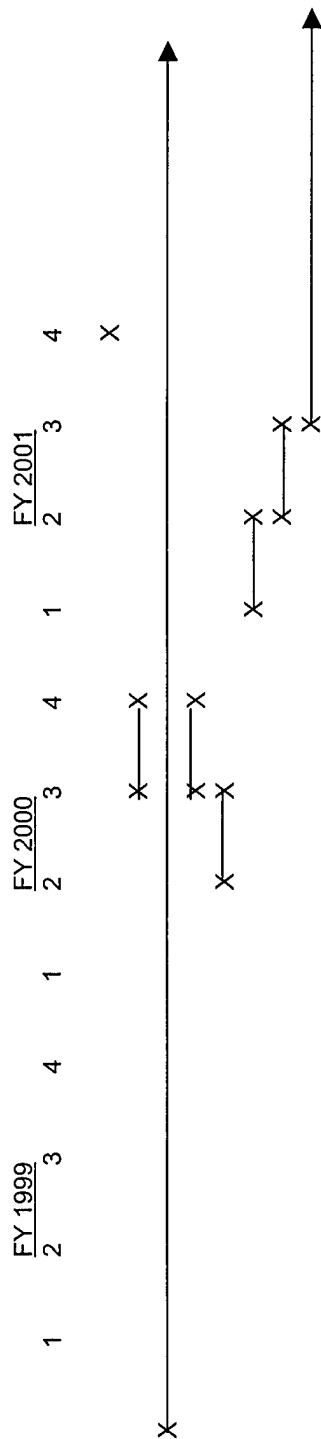
PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: Tactical Control System

(U) E. SCHEDULE PROFILE Cont.

(U) T&E Milestones

TCS Capability for MAE  
Launch / Recovery  
C4I Integration  
EDU Land-Based DT  
EB6 Pioneer Demo  
TUAV DT  
TUAV IOT&E  
VTUAV DT



(U) Contract Milestones  
VTUAV/TUAV SI Award

X

PROJECT NUMBER: A2768  
PROJECT TITLE: VTUAV  
(formerly VTOL UAV)

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EXHIBIT R-3, FY 2001 RDT&amp;E,N COST ANALYSIS

DATE: February 2000

## BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2478

PROGRAM ELEMENT TITLE: TACTICAL UNMANNED AERIAL VEHICLES

PROJECT TITLE: Tactical Control System

<u>Cost Categories:</u>	<u>Contract Method</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	FY 1999		FY 2000		FY 2001		<u>Target Value of Contract</u>
				<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>	
Primary Software Development	WR	NSWC-DD Dahlgren, VA	*	2,600	12/98	1,000	12/99			
Primary Hardware Integration	WR	NSWC-DD Dahlgren, VA	*	1,500	12/98	0				
Systems Engineering	WR	NSWC-DD Dahlgren, VA	*	4,063	12/98	2,740	12/99	3,080	12/00	CONT.
Primary Software Development	CPAF	Raytheon, Falls Church, VA	*	0		7,733	12/99	9,662	12/00	CONT.
Primary Hardware Integration	CPAF	Raytheon, Falls Church, VA	*	4,000	12/98	800	12/99	1,200	12/00	CONT.
Systems Engineering	CPAF	Raytheon, Falls Church, VA	*	0		590	12/99	1,085	12/00	CONT.
Primary Software/ Hardware Integration	MIPR	JTC/SIL, Huntsville, AL	*	**1,000	12/98	1,500		0		
Systems Integration	CPAF	Raytheon, Falls Church, VA	*	3,501	12/98	3,383	12/99	5,535	12/00	CONT.
Development of the Predator Data Control Module	CPFF	GA-ASI, San Diego, CA	*	1,509	12/98	1,100	12/99	500	12/00	CONT.
Development of the Outrider Data Control Module	CPFF	Alliant Techsystems, Hopkins MN	*	536	12/98	0		0		536
Human Computer Interface Development	WR	NAWC-AD, Patuxent River, MD	*	240	12/98	300	12/99	300	12/00	CONT.
<b>Subtotal Project Development</b>				<b>18,949</b>		<b>19,146</b>		<b>21,362</b>		<b>CONT.</b>
<b>Remarks:</b>										
• Prior Years funded under PE 0305204D;FY99 contract award fee is 100%.										
<b>Support Organizations</b>										
Configuration Management	WX,RC MIPR CPAF	NSWC-DD, Dahlgren, VA	*	813	12/98	140	12/99	280	12/00	CONT.
Configuration Management		Raytheon, Falls Church,VA	*	0		985	12/99	1,200	12/00	CONT.
Training/Logistics	WX,RC	Various	*	2,669	12/98	1,825	12/99	4,610	12/00	CONT.

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2478

PROGRAM ELEMENT TITLE: TACTICAL UNMANNED AERIAL VEHICLES

PROJECT TITLE: Tactical Control System

Contract Method	Performing Activity & Location	Total Prior Yrs	FY 1999		FY 2000		FY 2001		Total	Target Value of
			Cost	Date	Cost	Date	Cost	Date		
Support Organizations	CPAF	*	0		1,615	12/99	1,200	12/00	CONT.	CONT.
	MIPR	*	**4,600	12/98	0	12/99	2,300	12/00	CONT.	CONT.
Subtotal Support		*	8,082		4,565		9,590		CONT.	CONT.

## Remarks:

- \* Prior years funded under PE 0305204D
- \*\* Congressional Adjustment for MUSE support.

## Test and Evaluation

Test Support	WX,RC	NSWC-DD, Dahlgren, VA	*	562	12/98	420	12/99	520	12/00	CONT.	CONT.
Test Support	WX	NPS, Monterey, CA	*	422	12/98	650	12/99	1,362	12/00	CONT.	CONT.
Miscellaneous	WR,RX, MIPR	Various	*	1,117		1,480	12/99	7,150	12/00	CONT.	CONT.

## Subtotal Test & Evaluation:

- Remarks:
- \* Prior year funding under PE 0305204D

## Management Support

Program Management Support	WX,RX MIPR	Various	*	1,888	12/98	420	12/99	401	12/00	CONT.	CONT.
Travel	WX, MIPR	Various	*	905	12/98	720	12/99	993	12/00	CONT.	CONT.
Subtotal Management			*	2,793		1,140		1,394		CONT.	CONT.

Remarks: \* Prior year funding under PE 0305204D

## Total Cost

	*	31,925		27,401		41,378		CONT.	CONT.	CONT.	CONT.
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Exhibit R-2a, RDT&E Project Justification  
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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0305204N      PROJECT NUMBER: A2479  
 PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles      PROJECT TITLE: Applied Technology (AT)  
 (Formerly Common Systems Development) (CSD))

U) COST: (Dollars in Thousands)

Project Number & Title	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
A2479 Applied Technology (AT)	*8,986	9,647	7,832	7,335	7,914	8,084	8,292	CONT.	CONT.
TOTAL	*8,986	9,647	7,832	7,335	7,914	8,084	8,292	CONT.	CONT.

- \* The FY99 budget reflects a \$5,048K Congressional transfer from the Defense Airborne Reconnaissance Office (DARO) for AT executed under A2668, which has been revised by \$12K for Congressional undistributed adjustments and \$23K for inflation savings. The FY99 budget reflects a \$4,000K Congressional add for the multi-function self aligned gate array technology executed under A2670, which has been revised by \$9K for Congressional undistributed adjustments and \$18K for inflation savings.
- \*\* The FY00 budget reflects a \$3,000K Congressional add for the multi-function self, aligned gate array technology will be executed under A2670, which has been revised by \$16K for Congressional undistributed adjustments.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Applied Technology (AT) (formerly Common Systems Development (CSD)) pursues RDT&E of technology supporting advancement in Naval VTOL tactical and medium altitude endurance (MAE) Unmanned Aerial Vehicles (UAVs). Focus of effort is integrated use of UAVs in a Joint Task Force but also emphasizes the needs of any task force including expeditionary units as they are injected into emerging trouble spots. Augments any units ability to develop and maintain an accurate real time tactical situation perspective. Developing smaller, more capable payloads to enhance ability to carry multiple modular mission payloads. There is a stated need for a tactical MAE platform to support maritime operations. AT is leading exploration of Naval MAE concepts. Near term focus on demonstrating concepts of operation that will better define system requirements and support decisions regarding need for organic Naval MAE UAV. Technology focus is on approaches that will evolve to address the needs of unmanned combat systems. In this light, AT provides acquisition lead for the UAV Advanced Technology Review Board (ATRB). Resulting technology roadmap is the basis for a systems approach to incorporating UAVs into the taskforce vision for 2003 and beyond and provides ONR with operator perspective of unified vision of the task force of the future. AT funds technology transition, supports VTUAV Program and moves promising technologies from development into utility assessment by operational units for mission expansion following deployment. AT supports initiatives to evaluate and reduce Total Ownership Cost by improving supportability and incorporating appropriate COTS and NDI applications. AT Balances cost with warfighter needs in effectiveness, availability, interoperability, and capability. AT is actively working initiatives for appropriate use of UAVs in enhanced reconnaissance to the warfighter, Suppression of Enemy Air Defenses, Counter Mine Warfare, Counterproliferation, Personnel Recovery, Military Operations in Urban Terrain, Precision and Real Time Targeting, Riverine Operations, Non-combatant Evacuation Operations, Information Warfare, and Defense Conversion. Emphasis on developing smaller, lighter, cheaper, more capable payloads and air vehicle subsystems supports goal of addressing previously stated warfighter needs and enhancing the potential of small affordable UAVs for special military uses. AT supports cooperative R&D arrangements with major allies and NATO, providing day-to-day management and policy oversight regarding UAV export control and foreign military sales case management. Fabricate Hardware and conduct Bench Tests to demonstrate MLAS simultaneous transmit/receive of multiple signals.

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### EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT NUMBER: A2479

PROJECT TITLE: Applied Technology (AT)  
(Formerly Common Systems Development) (CSD))

#### (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

##### 1. FY 1999 Accomplishments:

- (U) (\$1,710) Initiated and supported integration, demonstration, and testing of growth payloads
- (U) (\$400) Continued international initiatives and exchange with Allies to improve UAV integration into NATO Task Force Operations
- (U) (\$600) Completed development of UCARS and MIAG for transition to operational user
- (U) (\$200) Investigated alternative UAV automatic launch/recovery technologies
- (U) (\$643) Supported small-drone demonstrations and special payload integration in response to user community requirements
- (U) (\$1,460) Continued common integration, test, logistics and international support efforts
- (U) (\$3,973) Conducted Congressionally-directed research of Multifunction Self-Aligned Gate (MSAG) active array antenna

##### 2. FY 2000 Plan:

- (U) (\$2,400) Initiate and support integration, demonstration, and test of growth payloads
- (U) (\$2,000) Develop Naval MAE UAV concepts of operation and conduct technology assessments
- (U) (\$1,700) Demonstrate operational utility of endorsed UAV ATRB technologies
- (U) (\$600) Continue international initiatives to improve UAV integration into NATO Task Force Operations and common international support efforts
- (U) (\$2,947) Conduct Congressionally-directed research of Multifunction Self-Aligned Gate (MSAG) active array antenna

##### 3. FY 2001 Plan:

- (U) (\$2,839) Initiate and support integration, demonstration, and test of growth payloads
- (U) (\$2,000) Support exercises to demonstrate Naval MAE UAV concepts and military potential
- (U) (\$2,293) Demonstrate operational utility of endorsed UAV ATRB technologies
- (U) (\$700) Continue international initiatives to improve UAV integration into NATO Task Force Operations and common international support efforts

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DATE: February 2000

## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0305204N      PROJECT NUMBER: A2479  
 PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles      PROJECT TITLE: Applied Technology (AT)

### (U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>
(U) FY 2000 President's Budget:	9,027	6,700	7,927
(U) Appropriated Value:	9,048		
(U) Adjustments from President's Budget:	-41	2947	-95
(U) FY2001 President's Budget Submit	8,986	9,647	7,832

### CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY99 decrease of \$41 thousand is for Inflation Savings. The FY 2000 net increase of \$2,947 thousand reflects a \$3,000 thousand increase for the MSAG Program, offset by a \$53 thousand Congressional Across-the-Board Rescission. FY 2001 net decrease of \$95 thousand reflects a \$40 thousand increase for Navy Working Capital Fund(NWCF) adjustments and a \$24 thousand increase for Military and Civilian Pay; and is offset by a \$74 thousand decrease for Strategic Sourcing Plan Savings, a \$64 thousand decrease for revised economic assumptions, and a \$21 thousand decrease for the reprioritization of requirements within the Navy.

(U) Schedule: Schedule changes reflect the program change in emphasis from common systems to more maritime specific requirements.

(U) Technical: N/A

(U) C. OTHER PROGRAM FUNDING SUMMARY: Not applicable.

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DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0305204N  
PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT NUMBER: A2479  
PROJECT TITLE: Applied Technology (AT)  
(Formerly Common Systems Development) (CSD))

(U) D. ACQUISITION STRATEGY: The key objectives of this program element are to: apply emerging technologies to enhance the value of UAVs in addressing warfighter needs; develop warfighter awareness of UAV capabilities to improve development of concepts of operation and feedback into the development and acquisition processes; develop and demonstrate promising technology to assist in determining military utility; work with the international community to avoid unnecessary and costly duplication and to enhance interoperability; lead the Advanced Technology Review Board to focus basic research on future needs. AT assists in transition of developmental capabilities into operational capability. Effort will emphasize VTUAV mission expansion following system IOC and clarification/development of MAE mission roles and systems requirements. Funds development and demonstration of subsystems believed capable of meeting stated military requirements such as small lightweight Laser designators, communications relays, mine countermeasures, chemical agent detectors, and miniature infrared cameras. Pursues developing a performance specification for a common payload interface and payload performance specifications based on user needs in critical mission areas. Participate in international cooperative agreements to share common interest developments.

(U) E. SCHEDULE PROFILE (CONT.)

T&E Milestones

	FY1999				FY2000				FY2001			
	1	2	3	4	1	2	3	4	1	2	3	4
Demo IR Microcam night vision sensor												
Comms Relay Demo												
Pan-tilt-zoom for IR Microcam												
Real-time Precision Targeting Demos												
Lightweight Laser Designator Subsystem												
NATO PG-35 Ship Based Level 5 TCS Demo												
MAE CONOPS Development Tests												
Payload Validation Tests												

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## Contract Milestones

## Precision Targeting

## Pan-tilt-zoom IR Microcam

## Small Lightweight Laser

## Communications Relay

## Advanced Technology Demo

Lightweight SAR

**X**

**X**

**X**

X

**X**

**X**

**X**

**X**

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROGRAM ELEMENT TITLE: TACTICAL UNMANNED AERIAL VEHICLES

PROJECT NUMBER: A2479

PROJECT TITLE: APPLIED TECHNOLOGY (AT)  
(Formerly Common Systems Development)(CSD))

<u>Cost Categories:</u>		Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		FY 2001		Total Cost	Complete	Award Date	Cost to Complete	Total Cost	Target Value of Contract
					Cost	Date	Cost	Date	Cost	Date	Cost	Date						
Primary Hardware Development		CPFF	APL		200	5/99												200
		WX	NAWCWD		400	6/99	500	3/00	600	3/01								
		CPFF	MARCONI		100	7/99												100
		WX	NAWC/AD		900	1/99	1,000	1/00	1,200	1/01								
		WX	NSWC/CD		100	1/99	100	1/00	200	1/01								
		CPFF	North/Grumman		150	5/99												150
		MP	NRL		157	5/99												
		CPFF	Sierra Nevada Corporation		624	7/99												624
		WX	NSAWC(Fallon)				500	1/00	500	1/01								
		CPFF	TBD (MAE)				1,000	2/00	1,200	2/01								Cont.
		CPFF	TBD (Payload)				1,050	2/00	1,343	2/01								Cont.
		Sect. 845	ITT Gilfillon		3,795	5/99	2,947	2/00										

Subtotal Product Development

0

7,097

5,043

Cont.

Remarks:

Development Support

IQ/T&M(8A  
COMP)

H.J. FORD

1/99

12/99

12/00

Cont.

Cont.

Subtotal Support

1,601

1,550

1,850

Cont.

Remarks:

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Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 16 of 30)



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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROGRAM ELEMENT TITLE: TACTICAL UNMANNED AERIAL VEHICLES

PROJECT NUMBER: A2479

PROJECT TITLE: APPLIED TECHNOLOGY (AT)  
(Formerly Common Systems Development) (CSD))

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		Total Cost	Target Value of Contract
				FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date		
Test and Evaluation		Misc.		1,000	1/99	1,000	12/99	1,000	12/00	Cont.	
										Cont.	
Subtotal Test & Evaluation			0	1,000		1,000		1,000		Cont.	Cont.

Remarks:

Subtotal Management

Remarks:

Total Cost

0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	8,986	9,647	7,832	Cont.	Cont.	Cont.	Cont.	Cont.	Cont.	Cont.	Cont.	Cont.	Cont.

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Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 17 of 30)

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0305204N**

**PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles**

**PROJECT NUMBER: A2671**

**PROJECT TITLE: Multiple-Participant**

**Competitive Demonstration**

**U) COST: (Dollars in Thousands)**

<u>Project Number &amp; Title</u>	<u>FY 1999</u> <u>Actual</u>	<u>FY 2000</u> <u>Estimate</u>	<u>FY 2001</u> <u>Estimate</u>	<u>FY 2002</u> <u>Estimate</u>	<u>FY 2003</u> <u>Estimate</u>	<u>FY 2004</u> <u>Estimate</u>	<u>FY 2005</u> <u>Estimate</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
A2671 Multiple-Participant Competitive Demonstration	9,932	0	0	0	0	0	0	0	9,932
<b>TOTAL</b>	<b>9,932</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9,932</b>

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Multiple-Participant Competitive Demonstration, known also as the VTOL Demonstration, provides the opportunity to assess the maturity of VTOL UAV technologies, evaluate air vehicle performance, minimize risks in development of VTOL UAVs in the Naval environment and gather lessons learned for future acquisition.

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Exhibit R-2a, RDT&E Project Justification  
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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

**DATE:** February 2000

**BUDGET ACTIVITY:** 7

**PROGRAM ELEMENT:** 0305204N

**PROGRAM ELEMENT TITLE:** Tactical Unmanned Aerial Vehicles

**PROJECT NUMBER:** A2671

**PROJECT TITLE:** Multiple-Participant  
Competitive Demonstration

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

Previous Accomplishments under Program Element 0305204D: FY97, FY98 and FY99 Congressional plus-up funds were provided to execute a VTOL UAV demonstration program with three contractors. The purpose of the demonstration program was to evaluate current VTOL UAV air vehicles which demonstrate the potential to meet or exceed defined performance objectives and to evaluate air vehicle technology risks associated with a VTOL UAV system operating in the Naval environment. The contracts for the demonstration program included 50 hours of flight test at a Government range, payload integration and demonstration and a life cycle cost estimate from the contractors. All three contractors concluded the initial phase of the demonstration. The demonstration program continued in FY99 with the integration of the UAV Common Automatic Recovery System (UCARS) which will allow highly accurate autonomous recoveries to shipboard-size landing spots. Efforts have also been conducted to identify feasible equipment to host Tactical Control Systems (TCS) workstations aboard targeted classes of Naval surface ships. Both of these significantly mitigate future risks associated with shipboard integration during the VTUAV Acquisition Program.

**1. FY 1999 Accomplishments:**

- (U) (\$3,646) Conducted land based UAV Common Automatic Recovery System (UCARS) efforts.
- (U) (\$6,286) Conducted shipboard demonstration efforts to include TCS integration efforts.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0305204N**

**PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles**

**PROJECT NUMBER: A2671**

**PROJECT TITLE: Multiple-Participant  
Competitive Demonstration**

**(U) B. PROGRAM CHANGE SUMMARY**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	9,977	0	0
(U) Appropriated Value:	10,000		
(U) Adjustments from President's Budget:	-45	0	0
(U) FY2001 President's Budget Submit	9,932	0	0

**CHANGE SUMMARY EXPLANATION:**

(U) Funding: FY 1999 reflects a \$45 thousand decrease for inflation savings.

(U) Schedule: The schedule for the shipboard demonstration has been updated to reflect the revised schedule for one of the two VTOL Demonstrators.

(U) Technical: N/A

**(U) C. OTHER PROGRAM FUNDING SUMMARY: Not applicable.**

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT NUMBER: A2467

PROJECT TITLE: Multiple Participant Competitive Demonstration

(U) D. ACQUISITION STRATEGY: The Multiple Participant Competitive Demonstration (VTOL UAV Demonstration) was designed as a program to evaluate current VTOL UAV air vehicles which demonstrate the potential to meet or exceed defined performance objectives and to evaluate air vehicle technology risks associated with a system operating in the Naval environment. This demonstration was congressionally directed and congressional plus-up funds were made available. A production representative VTOL UAV System would not be down-selected from the VTOL Demonstration contractors. Any acquisition program for a production VTOL UAV System would be the result of a free and open competition.

### (U) E. SCHEDULE PROFILE

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>				<u>FY2002</u>				<u>FY2003</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Program Milestones																								
Landbased UCARS																								
Ship Demo																								
				X																				
				X																				
(U) Contract Milestones																								
Option Exercise																								
(U) Engineering Milestones																								
Landing System Data																								
Ship Install Data																								
(U) T&E Milestones																								
Test Readiness Review (TRR)																								
TCS Demo																								

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**EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS**

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2671

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: Mult. Part. Comp. Demo

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>FY 2001</u>		<u>Target Value of Contract</u>
				<u>Cost</u>	<u>Award Date</u>	<u>Cost</u>	<u>Award Date</u>	<u>Cost</u>	<u>Award Date</u>	<u>Complete Cost</u>	<u>Total Cost</u>	
Project Development Organizations Project Integration	CPFF	Bell Helicopter		3,301	2/99	0		0		0	3,301	3,301
	CPFF	Bombardier		2,952	1/99	0		0		0	2,952	2,952
Subtotal Project Development				6,253		0		0		0	6,253	6,253
<u>Support Organizations</u>												
DEMO Support	WX	NAWC-AD Patuxent River, MD		1,955	1/99	0		0		0	1,955	
Ship Integration	PD	NAVSEA		305	3/99	0		0		0	305	
Documentation	WX	NSWC, Crane, IN		165	2/99	0		0		0	165	
Training	WX	NAWC Indian Hd., MD		263	6/99	0		0		0	263	
Subtotal Support				2,818		0		0		0	2,818	
Remarks:												

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2671

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: Mult. Part. Comp. Demo

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>Total Cost</u>	<u>Target Value of Contract</u>
				<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>		

Test & Evaluation Organizations

Flight Testing	MIPR	USA Yuma Proving Ground, Yuma, AZ	204	6/99	0	0	0	0	0	204	0
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**Subtotal Test & Evaluation**

204	0	0	0	0	0	204	0
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Remarks:

Management Organizations

Technical and Management Support	FFP	H. J. FORD	289	3/99	0	0	0	0	0	289	0
MISC.	VARIOUS	VARIOUS	498	VARIOUS	0	0	0	0	0	498	0

**Subtotal Management**

787	0	0	0	0	0	787	0
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Remarks:

**Total Cost**

9,932	0	0	0	0	0	9,932	6,253
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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0305204N**      **PROJECT NUMBER: A2768**  
**PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles**      **PROJECT TITLE: VTUAV**  
(formerly VTOL UAV)

U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999</u> <u>Actual</u>	<u>FY 2000</u> <u>Budget</u>	<u>FY 2001</u> <u>Estimate</u>	<u>FY 2002</u> <u>Estimate</u>	<u>FY 2003</u> <u>Estimate</u>	<u>FY 2004</u> <u>Estimate</u>	<u>FY 2005</u> <u>Estimate</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
A2768 VTUAV (formerly VTOL UAV) Quantity of RDT&E Articles	0	38,277	63,842	48,478	19,422	0	0	0	170,019
<b>TOTAL</b>	0	38,277	63,842	48,478	19,422	0	0	0	170,019

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: VTUAV will provide users real-time and near-real-time data required to support ISR efforts without the use of manned aircraft or reliance on limited joint theater or national assets. Missions supported under ISR and accomplished by a VTUAV include over-the-horizon classification and targeting, mine countermeasures, battle management, chemical/biological agent reconnaissance and signals intelligence. The VTUAV would be an organic asset of the ship to which it is attached or deployed. The forte of the VTUAV is that it launches and recovers vertically and it can operate from any/all air capable ships as well as confined land based areas. Other capabilities of the VTUAV include: autonomous waypoint navigation; automatic launch and recovery of the vehicle both ashore and afloat; incorporation of a heavy fuel engine and the ability to incorporate modular mission payloads. The data from the VTUAV System would be provided to the user through standard DoD Command, Control, Communications, Computers and Intelligence (C4I) systems, architectures and protocols.

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DATE: February 2000

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0305204N**

**PROJECT NUMBER: A2768**  
**PROJECT TITLE: VTUAV**  
(formerly VTOL UAV)

**PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles**

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

1. FY 1999 Accomplishments: N/A
2. FY2000 Plan:
  - (U) (\$30,655) Initiate system design, fabrication and testing.
  - (U) (\$ 5,154) Government support of VTUAV proposal evaluations leading up to MSII decision and design evaluation.
  - (U) (\$ 2,468) Funds miscellaneous efforts including technical and management support and initial test efforts.
3. FY 2001 Plan:
  - (U) (\$47,083) Continue system design, fabrication and component testing. Procure initial LRIP.
  - (U) (\$10,375) Conduct operational assessment and initiate developmental testing
  - (U) (\$ 6,384) Funds miscellaneous efforts including technical and management support.

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DATE: February 2000

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0305204N**

**PROGRAM ELEMENT: 0305204N**  
**PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles**

**PROJECT NUMBER: A2768**  
**PROJECT TITLE: VTUAV**  
**(formerly VTOL UAV)**

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>
(U) FY 2000 President's Budget:	0	38,489	43,407
(U) Appropriated Value:	0	38,489	
(U) Adjustments from President's Budget:	0	-212	20,435
(U) FY2001 President's Budget Submit	0	38,277	63,842

**CHANGE SUMMARY EXPLANATION:**

(U) Funding: The FY 2000 decrease reflects a \$212 thousand decrease for an Across-the-Board Congressional rescission. FY 2001 net increase of \$20,435 thousand reflects a \$18 thousand increase for Military and Civilian Pay, a \$34 thousand increase for Navy Working Capital Fund(NWCF) adjustments, a \$44,520 thousand increase for Nassau MV-22 Integration; and is offset by a \$23,680 thousand decrease to fund Tactical Control System efforts, a \$91 thousand decrease for Strategic Sourcing Plans Savings, a \$199 thousand decrease for revised economic assumptions, and a \$167 thousand decrease for reprioritization of requirements within the Navy.

(U) Schedule: With the approval of the Direct Down-Select Strategy for the VTUAV program, the following schedule changes occurred: EMD will be initiated with contract award vice a follow on down select. The Critical Design Review (CDR) shifted from 4Q FY2000 to 1Q FY2001. The first Low Rate Initial Production (LRIP) system option shifted from FY2002 to FY2001 and the operational testing has shifted right one quarter.

(U) Technical: N/A

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( U ) C. OTHER PROGRAM FUNDING SUMMARY:

Appn WPN	FY 1998 Budget	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete Continuing	Total Program Continuing
						\$39,626	\$56,083	\$62,799		

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

**DATE:** February 2000

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0305204N**      **PROJECT NUMBER: A2768**  
**PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles**      **PROJECT TITLE: VTUAV**  
(formerly VTOL UAV)

(U) D. ACQUISITION STRATEGY: VTUAV program will have a combined Milestone I/Milestone II decision in 2Q FY2000. Development, fabrication and developmental test of the VTUAV system is scheduled to begin in FY 2000 and continue through FY 2001/2002. A low rate initial production decision is planned for FY 2001 with operational testing being conducted in FY 2002. A Milestone III decision is planned for 2Q FY 2003 and the initial operational capability (IOC) would occur during 4Q FY 2003. Initial planning has a VTUAV system defined as: air vehicles (AV's), ground control stations (GCS's), modular mission payloads, remote data terminals, and spares. Connectivity into the DOD C4I architecture would be provided by the GCS, which is to be TCS compatible. Although not currently designated as a joint program, the VTUAV program can accommodate Joint Services (Army, Navy and Marine Corps) as well as U.S. Coast Guard requirements into the acquisition planning process. A key objective of the VTUAV program would be to minimize the Total Ownership Cost (TOC) of the system while providing the maximum utility to the user.

**(U) E. SCHEDULE PROFILE**

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>				<u>FY2002</u>				<u>FY2003</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Program Milestones																								
Program Initiation, M/SI/II																								
EMD																								
MSIII																								
IOC																								
(U) Contract Milestones																								
Direct Down-Select																								
LRIP 1																								
(U) Engineering Milestones																								
CDR																								
PRR																								
(U) T&E Milestones																								
Informal OPTEVFOR Eval																								
Developmental Testing																								
Operational Testing																								

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2768

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles  
(formerly VTOL UAV)

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
<u>Project Development Organizations</u>												
Design/Hardware Development	CPIFAF	TBD		0		30,655	02/00	47,083	03/01	CONT.	CONT.	TBD
Ship Reconfiguration Hardware	PD	NAVSEA Arlington, VA		0				1,564	11/00	CONT.	CONT.	
Subtotal Project Development						30,655		48,647		CONT.	CONT.	
Remarks:												
<u>Support Organizations</u>												
Development Support	WX	NAWC-AD Patuxent River,MD				2,935	11/99	2,484	11/00	CONT.	CONT.	
Logistics Training	WX	NSWC Indian Hd., MD				728	11/99	313	11/00	CONT.	CONT.	
Logistic Support	WX	NAWC Lakehurst, NJ				300	12/99					
Logistic Support	WX	NSWC Crane, IN				200	12/99					
Other						102	11/99	105	11/00	CONT.	CONT.	
Subtotal Support						4,265		2,902		CONT.	CONT.	
Remarks:												

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2768

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: VTUAV

(formerly VTOL UAV)

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
<u>Test &amp; Evaluation Organizations</u>												
Developmental Testing	WR	NAWC-AD Patuxent River MD				306	12/99	3,322	11/00	CONT.	CONT.	
Operational Testing	WR	OPTEVFOR Norfolk, VA			0			313	03/01	CONT.	CONT.	
Developmental Testing	TBD	TBD						6,740	03/01			
<b>Subtotal Test &amp; Evaluation</b>						<b>306</b>		<b>10,375</b>		<b>CONT.</b>	<b>CONT.</b>	
Remarks:												
<u>Management Organizations</u>												
Technical and Management Support	FFP	H. J. FORD				1,300	10/99	1,570	10/00	CONT.	CONT.	TBD
Management Support	MP	CECOM/MITRE				390						
MISC.	VARIOUS	VARIOUS				1,361	10/99	348	10/00	CONT.	CONT.	
<b>Subtotal Management</b>						<b>3,051</b>		<b>1,918</b>		<b>CONT.</b>	<b>CONT.</b>	
Remarks:												
<b>Total Cost</b>						<b>38,277</b>		<b>63,842</b>		<b>CONT.</b>	<b>CONT.</b>	

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**EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0305206N**  
**PROGRAM ELEMENT TITLE: Airborne Reconnaissance Advanced Development (ARAD)**

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999*</u> <u>Actual</u>	<u>FY 2000</u> <u>Budget</u>	<u>FY 2001</u> <u>Estimate</u>	<u>FY 2002</u> <u>Estimate</u>	<u>FY 2003</u> <u>Estimate</u>	<u>FY 2004</u> <u>Estimate</u>	<u>FY 2005</u> <u>Estimate</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
H2694 Advanced Digital Sensors	3,034	2,970	2,861	7,749	8,602	17,724	22,476	CONT	CONT
R2476 Framing Reconnaissance Camera	13,303	**15,883	1,898	0	2,907	0	0	2,907	33,991
<b>TOTAL</b>	<b>16,337</b>	<b>18,853</b>	<b>4,759</b>	<b>7,749</b>	<b>11,509</b>	<b>17,724</b>	<b>22,476</b>	<b>CONT</b>	<b>CONT</b>

Quantity of RDT&E Articles

\*FY 1999 H2694 funds were executed under NAVAIR Project Unit H2675 and R2476 funds were executed under ONR Project Unit's R2476 & R2676

\*\*FY 2000 budget for R2476 includes a Congressional add in the amount of \$10M for E-O Framing Technologies and \$4M for Hyperspectral Modular Reconnaissance which has been reduced by \$89K for an Across-the-Board Reduction.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Provides funds for the development of sensor systems to improve present airborne reconnaissance capabilities. The developments are driven by evolving collection requirements and modern technology advances. The developments allow for the necessary changes required to meet an integrated, objective airborne reconnaissance architecture as defined in the Integrated Airborne Reconnaissance Strategy (IARS) and amplified in the Airborne Reconnaissance Information Technical Architecture (ARITA). Particular emphasis is placed on multi-platform interoperability. The Advanced Sensors Development Program implements successful proof-of-concept efforts accomplished in the Advanced Technology Program, other Service/Agency developments, and Congressionally-funded initiatives leading to producible sensor systems for airborne platforms. Upon successful sensor prototype demonstration, technology sensor developments are turned over to the Services for procurement and platform integration. The advanced sensor program includes technical analyses, systems engineering assessments, planning, and development for advanced airborne sensor systems. This effort focuses on developments, which support sensor system interoperability and standardization of multi-Service and multi-platform applications. The advanced sensor developments will provide the technology transition modules for operational use necessary for the overall migration of the airborne fleet (manned and unmanned) to a Joint Airborne SIGINT Architecture (JASA) (i.e., sensors, ground systems, data links, and platforms), and provide the mechanism required for timely dissemination of intelligence information to operational forces. The development and modification of the lead integration aircraft (EP-3E) for the initial JASA modules will provide a mechanism to begin development and operational assessment of the Joint SIGINT Avionics Family (JSAF) components. Coordinated and complementary airborne sensor development across the military Services and the Defense and Intelligence Agencies are being established for inclusion into the JASA. This sub-project also includes funding for U-2 sensor upgrades and multispectral imaging (MSI) developments.

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(U) JUSTIFICATION OF BUDGET ACTIVITY: This program is categorized as Budget Activity 7 because it provides for the development of technologies and capabilities in support of Operational Systems Development and for the Navy's TARPS-CD and SHARP programs. For these Navy programs, technology to support the development of dual band (EO and IR) sensors (emphasizing framing sensors) will be pursued. Future plans will expand the dual band capabilities of these sensors to MSI features.

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305206N

PROGRAM ELEMENT TITLE: Airborne Reconnaissance Advanced Development (ARAD)

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1999* Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To		Total Program CONT
								Complete	CONT	
H2694 Advanced Digital Sensors	3,034	2,970	2,861	7,749	8,602	17,724	22,476			
<b>TOTAL</b>	<b>3,034</b>	<b>2,970</b>	<b>2,861</b>	<b>7,749</b>	<b>8,602</b>	<b>17,724</b>	<b>22,476</b>	<b>CONT</b>	<b>CONT</b>	<b>CONT</b>

Quantity of RDT&E Articles

\*FY 1999 funds executed under NAVAIR Project Unit H2675.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Provides funds for the development of sensor systems to improve present airborne reconnaissance capabilities. The developments are driven by evolving collection requirements and modern technology advances. The developments allow for the necessary changes required to meet an integrated, objective airborne reconnaissance architecture as defined in the Integrated Airborne Reconnaissance Strategy (IARS) and amplified in the Airborne Reconnaissance Information Technical Architecture (ARITA). The advanced sensor program includes technical analyses, systems engineering assessments, planning, and development for advanced airborne sensor systems. This effort focuses on developments which support sensor system interoperability and standardization of multi-Service and multi-platform applications. The

EP-3E will undergo a series of block modification via an evolutionary acquisition process beginning in FY 2001. These block modifications have collectively been designated as the Joint SIGINT Avionics Family (JSAF) Modification Program (JMOD). The advanced sensor developments described herein will provide the technology transition modules necessary for the overall migration of the airborne fleet to a Joint Airborne SIGINT Architecture (JASA) (i.e., sensors, ground systems, data links, and platforms), and provide the mechanism required for timely dissemination of intelligence information to operational forces.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0305206N**

**PROJECT NUMBER: H2694**

**PROGRAM ELEMENT TITLE: Airborne Reconnaissance**

**PROJECT TITLE: Advanced Digital Sensors**

**Advanced Development (ARAD)**

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

**1. FY 1999 ACCOMPLISHMENTS:**

- (U) (\$1,113) Continued joint Phase III Common Processor Core (CPC) development
- (U) (\$ 180) Procured two CPC capable EPR-208s for SIL/Aircraft Integration & Test
- (U) (\$ 935) Continued Story Finder software hardware development and conducted Preliminary Design Review (PDR)
- (U) (\$ 806) Initiated Story Maker Fusion software requirements analysis

**2. FY 2000 PLAN:**

- (U) (\$ 890) Initiate joint Common Processor Core (CPC) Phase IV Development
- (U) ((\$ 962) Complete Story Finder development and Conduct Critical Design Review (CDR)
- (U) (\$ 160) Initiate Story Book CPC Phase I-III JSAF MOD 1 Software Integration Lab (SIL) Integration and Test
- (U) (\$ 210) Continue Story Finder JSAF MOD 1 SIL Integration and Development Test (DT) and Operational Assessment (OA)
- (U) (\$ 163) Initiate Story Book CPC Phase I-III JSAF MOD 1 aircraft integration
- (U) (\$ 160) Initiate Story Finder JSAF MOD 1 aircraft integration
- (U) (\$ 425) Complete Story Maker fusion software requirements analysis

**3. FY 2001 PLAN:**

- (U) (\$ 520) Initiate Story Maker fusion software development

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- (U) (\$1,066) Complete Story Finder JSAF MOD 1 aircraft integration
- (U) (\$ 320) Complete Story Book CPC Phase I-III JSAF MOD 1 aircraft integration
- (U) (\$ 292) Conduct Story Finder DT/Operational Test (OT) on EP-3E JSAF MOD 1 aircraft
- (U) (\$ 300) Conduct Story Book CPC Phase I-III DT/OT on EP-3E JSAF MOD 1 aircraft
- (U) (\$ 363) Continue joint Common Processor Core (CPC) Phase IV Development

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0305206N**      **PROJECT NUMBER: H2694**  
**PROGRAM ELEMENT TITLE: Airborne Reconnaissance**      **PROJECT TITLE: Advanced Digital Sensors**  
**Advanced Development (ARAD)**

**(U) B. PROGRAM CHANGE SUMMARY**

	<u>FY 1999*</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	3,048	2,986	6,921
(U) Appropriated Value:	3,055	2,986	
(U) Adjustments from Pres Budget:	-14	-16	-4,060
(U) FY 2001 President's Budget Submit:	3,034	2,970	2,861

\* FY 1999 funds executed under NAVAIR Project Unit H2675.

**CHANGE SUMMARY EXPLANATION:**

(U) The FY 1999 decrease of \$14 thousand is for inflation savings. The FY 2000 decrease reflects a \$16 thousand reduction for an Across-the-Board Congressional rescission. The FY 2001 net decrease of \$4,060 thousand includes a \$8K decrease for Navy Working Capital Fund (NWCFF), a \$3 thousand increase for Military and Civilian pay, a \$30 thousand decrease for revised economic assumptions, and a \$4,025 thousand reduction for reprioritization of requirements within the Navy.

(U) Schedule: The FY 1999 schedule change combined the 2Q/99 Story Finder Review and the 4Q/99 Story Book Review into the 3Q JSAF Mod 1 Preliminary Design Review (PDR). FY 2000 added a Critical Design Review (CDR) for JSAF Mod 1 (1Q/00) and redefined the 2Q/00 Development Test (DT) and Operational Assessment (OA) as the JSAF Mod 1 Software Integration Lab (SIL) DT/OA. FY 2001 and To Complete reflects the rebaseline of the program to EP-3E JSAF Block Mod Upgrades.

(U) Technical: Not Applicable

**(U) C. OTHER PROGRAM FUNDING SUMMARY**

<u>APPN</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>
	<u>Actual</u>	<u>Budget</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>
APN5 EP-3E OSIP 01-01			25,335	27,268	88,199	34,009	35,905	198,687

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0305206N      PROJECT NUMBER: H2694  
PROGRAM ELEMENT TITLE: Airborne Reconnaissance      PROJECT TITLE: Advanced Digital Sensors  
Advanced Development (ARAD)

Related RDT&E (Not applicable)

(U) D. ACQUISITION STRATEGY: Leverages/complements Air Force, Naval Research Laboratory, Office of Naval Research RDT&E efforts for technology insertions into EP-3E/PU productions programs.

(U) E. SCHEDULE PROFILE

FY 1999      FY 2000      FY 2001      TO COMPLETE

(U) Program Milestones

2Q/01 LRIP(2) for JSAF  
MOD 1 (Story Book and  
Story Finder) (MS III)

2Q/02 JSAF MOD 1  
FRP (Story Book and  
Story Finder)

(U) Engineering Milestones

3Q/99JSAF MOD 1  
(Story Finder  
/Book) PDR

1Q/00JSAF MOD 1  
(Story Finder  
/Book) CDR

(U) T&E Milestones

4Q/00JSAF MOD 1  
SIL DT/OA

3Q/01 JSAF MOD 1  
Acft DT/OT

3Q/02 JSAF MOD 2  
acft DT/OT (Story  
Maker)

(U) Contract Milestones

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305206N

PROJECT NUMBER: H2694

PROJECT TITLE: Advanced Digital Sensors

Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		Total Cost	Target Value of Contract
			Cost	Award Date	Cost	Award Date	Cost	Award Date		
CPFF	BTG, Vienna, VA;		580	Apr 99					0	580
CPFF	Sub-Melborne Raytheon Systems		236	May 99	884	Mar 00	906	Dec 00	0	2,026
CPFF	Raytheon, Greenville, TX		1,047	Aug 99	650	Mar 00	200	Dec 00	CONT	CONT
CPFF	GTE, Sunnyvale, CA		721	Jul 99	325	Feb 00	320	Dec 00	CONT	CONT
Subtotal Product Development			2,584		1,859		1,426		CONT	CONT
Remarks:										
CPFF	GRCI		400	Sep 99	400	Feb 00	400	Dec 00	CONT	CONT
WX	NAWC WD, China Lake, CA				253	Feb 00	200	Dec 00	CONT	CONT
Subtotal Support			400		653		600		CONT	CONT
Remarks:										
WX	NAWC AD, Pax River, MD				50	Feb 00	592	Dec 00	CONT	CONT
Subtotal Test & Evaluation					50		592		CONT	CONT
Remarks:										
WX	NAWC AD, Pax River, MD		50	Jun	408	Jan 00	243	Dec 00	CONT	CONT
Subtotal Management			50		408		243		CONT	CONT
Remarks:										
Total Cost			3,034		2,970		2,861		CONT	CONT

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0305206N      PROJECT NUMBER: R2476  
 PROGRAM ELEMENT TITLE: Airborne Reconnaissance      PROJECT TITLE: Framing Reconnaissance  
 Advanced Development (ARAD)      Camera

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>FY 2006 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
R2476 Framing Reconnaissance Camera	13,303	15,883	1,898	0	2,907	0	0	0	0	33,991
<b>TOTAL</b>	<b>13,303</b>	<b>15,883</b>	<b>1,898</b>	<b>0</b>	<b>2,907</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>33,991</b>

\*FY 1999 funds were executed under ONR Project Unit's R2476 & R2676

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: There are two primary objectives for the Advanced Technology funding: (1) to evaluate the utility and maturity of technology for airborne reconnaissance applications, and (2) to reduce the risk of employing emerging technologies in system upgrades, new system acquisitions, or Advanced Concept Technology Demonstrations (ACTDs), by integrating and exercising them in developmental and operational tests. These technologies help satisfy the requirements of the objective architecture set forth in the Integrated Airborne Reconnaissance Strategy (IARS). These technology investments are also identified in the Airborne Reconnaissance Technology Program Plan (ARTPP), published in November 1994. They were carefully selected from a broad range of technologies to provide utility to the warfighter at acceptable levels of cost and risk. This project continues technology transition programs in the critical areas identified in the ARTPP. This program leverages the commercial base at every opportunity while investing in carefully selected DoD-unique areas. Additionally, it defines near-term demonstrations in specific areas, followed by ones in which the most promising technology is chosen from a pool of possibilities currently under investigation within government and commercial sectors. Transition of sensors to AF TARS, and Navy TARPS-CD and SHARP programs has been successfully achieved.

### (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

#### 1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$4,513) Completed development, tested and flown 100 megapixel cameras.
- (U) (\$4,100) Initiated development of dual band EO/IR camera.
- (U) (\$3,400) Continued development of downsampled JPEG image compression boards.
- (U) (\$1,290) Initiated demonstration with precision strike capability.

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305206N

PROGRAM ELEMENT TITLE: Airborne Reconnaissance  
Advanced Development (ARAD)

PROJECT NUMBER: R2476

PROJECT TITLE: Framing Reconnaissance  
Camera

2. FY 2000 PLAN:

- (U) (\$ 172) Test compression boards
  - (U) (\$1,400) Begin flight test of dual band EO/IR camera
  - (U) (\$ 400) Test precision strike capable camera
  - (U) (\$9,936) Develop E-0 Framing Technologies
  - (U) (\$3,975) Develop Hyperspectral Modular Reconnaissance
3. FY 2001 PLAN:
- (U) (\$1,200) Complete flight test and evaluation of dual band EO/IR camera
  - (U) (\$ 698) Flight demonstration of precision strike capable reconnaissance camera

(U) B. PROGRAM CHANGE SUMMARY

	FY 1999	FY 2000	FY 2001
(U) FY 2000 President's Budget:	13,363	1,972	1,968
(U) Appropriated Value:	13,393	16,972	0
(U) Adjustments from Pres Budget:	-60	+13,911	-70
(U) FY 2001 President's Budget Submit:	13,303	15,883	1,898

CHANGE SUMMARY EXPLANATION:

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(U) Funding: The FY 1999 decrease of \$60 thousand is for inflation savings. The FY 2000 reflects a Congressional add in the amount of \$10M for E-O Framing Technologies and \$4M for Hyperspectral Modular Reconnaissance which has been reduced by \$89K for an Across-the-Board Reduction. FY 2001 net decrease of \$70 thousand includes a \$7 thousand rebalancing decrease, \$44 thousand decrease for Navy Working Capital Fund (NWCF), a \$2 thousand increase for Military and Civilian pay, \$21 thousand decrease for revised economic assumptions.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

## (U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
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### Related RDT&E

F/A-18 SHARP	\$29,845K	\$30,558K	\$25,588K	\$22,612K	\$1,966K			
HISTAR	\$3,200K	\$3,200K						

## (U) D. ACQUISITION STRATEGY:

## (U) E. SCHEDULE PROFILE

	FY 1999	FY 2000	FY 2001
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### (U) Program Milestones

(U) Engineering Milestones	3Q/Begin dual band Sensor Development	4Q Begin dual band camera flight tests 3Q Test compression boards 3Q Test precision strike capable camera	2Q Complete flight test of dual band camera 3Q Precision Strike flight demonstration
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### (U) T&E Milestones

### (U) Contract Milestones

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EXHIBIT R-3, FY 2000/2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305206N

PROJECT NUMBER: R2476

PROJECT TITLE: Framing Reconnaissance Camera

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
				<u>Cost</u>	<u>Award Date</u>	<u>Cost</u>	<u>Award Date</u>	<u>Cost</u>	<u>Award Date</u>			
100 Megapixel Camera Testing	CPFF, competitive	Recon Optical Lockheed Martin	4,513	4,513							4,513	
Compressionboards	CPFF, competitive	Space Dynamics Lab	3,400	3,400	2Q/99	0		0		0	3,400	
Precision strike	CPFF, competitive	1 TBD Contractor	1,290	1,290	2Q/99	400	1Q00	600	1Q01	2,500	4,790	
Dual Band EO/IR camera	CPFF, competitive	CPFF, Lockheed Martin	4,100	4,100	2Q/99	1,400	1Q/00	1,200	2Q01	150	6,850	
Technical support	CPFF, competitive	Recon Optical	0	0	1Q/99	172	1Q/00	98	1Q01	257	557	
E-O framing technologies						9,936					9,936	
Hyperspectral Modular Reconnaissance						3,975					3,975	
<b>Subtotal Product Development</b>			<b>0</b>	<b>13,303</b>		<b>15,883</b>		<b>1,898</b>		<b>2,907</b>	<b>33,991</b>	

Remarks: Direct support of system analysis and product development via in-house support, contracts, and contracted services.

Subtotal Support

0 0 0 0 0 0 0 0 0 0 0 0 0

Remarks:

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EXHIBIT R-3, FY 2000/2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305206N

PROJECT NUMBER: P809

PROJECT TITLE: Framing Reconnaissance Camera

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Subtotal Test & Evaluation			0	0		0		0		0	0	0
Remarks:												
Travel			0	0		0		0		0	0	0
Subtotal Management			0	0		0		0		0	0	0
Remarks:												
Total Cost			0	13,303		15,883		1,898		2,907	33,991	0

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**EXHIBIT R-2 FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

DATE: February 2000

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0305207N**  
**PROGRAM ELEMENT TITLE: DARP Special Project Aircraft**

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
R0117*      Reef Point	293	398	2,208	2,267	2,277	2,310	2,386	CONT.	CONT.
E2673      F/A-18E/F Tactical Reconnaissance (SHARP)									
	**29,709	**39,340	25,271	22,244	1,874	0	0	0	***121,255
Total	30,002	39,738	27,479	24,511	4,151	2,310	2,386	CONT.	CONT.
Quantity of RDT&E Articles:		2	3						5

\*Executed at a higher level of classification – no project R2.

\*\*Was executed under PE 0305207N, project R2673. The FY 2000 budget reflects a \$9,000 thousand Congressional add for Synthetic Aperture Radar (SAR) module development (R2808).

\*\*\* Includes \$2,817 executed under PE 0204136N, project E2350 (FY 1998)

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Provides funds for the development of a dual-spectral-band reconnaissance pod camera system capable of being deployed on tactical aircraft. The camera will have simultaneous visible and infrared imaging capability and provide digital images in national standard formats. The system will be capable of collecting imagery, recording on-board, and transmitting simultaneously to a ground receiving station. Cameras operating in multiple spectral bands will be introduced as the technology evolves. The target aircraft is the F/A-18E/F. A prototype system will be flight demonstrated by June 2001. Provision will be made to accommodate transmission of Synthetic Aperture Radar (SAR) data. The system will operate semi-autonomously from the aircraft maximizing standard interfaces. Emphasis will be placed on using commercially available subsystems and components in an open architecture so that evolutionary designs in cameras, processors, transmitters, and recorders can be introduced seamlessly via competitive procurement procedures. An aggressive development schedule will be embraced driving toward an operational capability by May 2003. The purpose of the aggressive development schedule is to have an operational capability ready to replace the F-14 Tactical Air Recce System (TARPS) due to retire beginning in 2003.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing systems.

**R-1 Item No. 192**  
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## EXHIBIT R-2a FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305207N

PROJECT NUMBER: E2673

PROGRAM ELEMENT TITLE: DARP Special Project Aircraft

PROJECT TITLE: F/A-18 Tactical  
Reconnaissance

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete	Total Program
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E2673*	F/A-18E/F Tactical Reconnaissance (SHARP) *29,709	*39,340	25,271	22,244	1,874	0	0	0	121,255**
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Quantity of RDT&E Articles: 2 3 5

\*Was executed under PE 0305207N, project R2673 in FY 1999 and FY 2000. The FY 2000 budget reflects a \$9,000 thousand Congressional add for Synthetic Aperture Radar (SAR) module development (R2808).

\*\*Includes \$2,817 executed under PE 0204136N, project E2350 (FY 1998)

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Shared Reconnaissance Pod (SHARP) provides funds for the development of a dual-spectral-band reconnaissance pod camera system capable of being deployed on tactical aircraft. The camera will have simultaneous visible and infrared imaging capability and provide digital images in national standard formats. The system will be capable of collecting imagery, recording on-board, and transmitting simultaneously to a ground receiving station. Cameras operating in multiple spectral bands will be introduced as the technology evolves. The target aircraft is the F/A-18E/F. A prototype system will be flight demonstrated by June 2001. Provision will be made to accommodate transmissiion of SAR data. The system will operate semi-autonomously from the aircraft maximizing standard interfaces. Emphasis will be placed on using commercially available subsystems and components in an open architecture so that evolutionary designs in cameras, processors, transmitters, and recorders can be introduced seamlessly via competitive procurement procedures. An aggressive development schedule will be embraced driving toward an operational capability by May 2003.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 1999 Accomplishments:

- (U) (\$400) Project Management coordinated development of the activities/contractors developing Rapid Prototype.
- (U) (\$400) System Engineering ensured design meets Operational Requirements Document (ORD) requirements and can be transitioned to a design that is producible and supportable.
- (U) (\$13,700) Designed and developed a generic pod that can be utilized by the SHARP program. Ensured that standard interfaces are used so the pod can be attached to any number of aircraft that utilize standard interfaces.
- (U) (\$1,500) Modified the hardback of the Long Range Oblique Photography System Engineering Pod to analyze the effects of vibration on sensor performance when a BRU 32 attachment is used.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE:** February 2000

**BUDGET ACTIVITY:** 7

**PROGRAM ELEMENT:** 0305207N

**PROGRAM ELEMENT TITLE:** DARP Special Project Aircraft

**PROJECT NUMBER:** E2673

**PROJECT TITLE:** F/A-18 Tactical  
Reconnaissance

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS (Continued):**

- (U) (\$1,600) Procured sensor to be used in SHARP Rapid Prototype.
- (U) (\$1,800) Purchased Non-Developmental Item recorders and datalink for the SHARP system.
- (U) (\$1,000) Began integration and testing of the SHARP subsystems.
- (U) (\$5,209) Developed the Tactical Reconnaissance Management System maximizing the use of Commercial Off-the-Shelf (COTS) computer hardware and began software design.
- (U) (\$2,500) Designed the software upgrade for minimal integration to the F/A-18 aircraft for demo.
- (U) (\$1,600) Logistics effort coordinated with pod/system designers to ensure the SHARP system is supportable and maintainable. Evaluated current support equipment to determine if it can be upgraded to support the SHARP equipment.

**(U) FY 2000 PLAN:**

- (U) (\$400) Project Management to coordinate development of the activities/contractors developing Rapid Prototype.
- (U) (\$2,600) Procure sensors to be used in SHARP Rapid Prototype.
- (U) (\$3,000) Procure 2 sensors for Engineering and Manufacturing Development (EMD) Phase.
- (U) (\$1,400) Complete integration and test of the SHARP subsystems for Rapid Prototype.
- (U) (\$2,000) Complete logistics plan and perform preliminary design of support equipment to ensure the Rapid Prototype can be transitioned to a fleet asset.
- (U) (\$300) Flight test sensors to evaluate their performance and compare to ORD requirements.
- (U) (\$800) Program Management to coordinate development activities during the EMD phase of the program.
- (U) (\$400) System engineering to ensure design meets ORD requirements and can be transitioned to a design that is producible and supportable. Identify trades that can be considered as part of the cost as an independent variable process.
- (U) (\$1,000) Systems engineering to develop EDM pods, design/develop the (software/hardware) Interface to the F/A-18 aircraft. Coordinate with other subsystems (F/A-18 Electronic Warfare, Weapons, and Radar) to ensure system compatibility. Coordinate with ground station activities to ensure compatibility.
- (U) (\$2,500) F/A-18 System Configuration Set (SCS) software for Rapid Prototype. Incorporate and test the software upgrade for F/A-18 minimal integration for demo of Rapid Prototype.
- (U) (\$500) F/A-18 SCS software. Upgrade demo tape for F/A-18 E/F aircraft. Update Tactical Aircraft Mission Planning System (TAMPS) for new sensors/design.

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## EXHIBIT R2-a FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305207N

PROGRAM ELEMENT TITLE: DARP Special Project Aircraft

PROJECT NUMBER: E2673

PROJECT TITLE: F/A-18 Tactical  
Reconnaissance

### (U) PROGRAM ACCOMPLISHMENTS AND PLANS (Continued):

- (U) (\$3,140) Begin RECCE Management System (RMS) software design for EMD phase. Design Built-In-Test (BIT) software to support Reliability and Maintainability (R&M) requirements. Upgrade integration labs/instrumentation.
- (U) (\$400) Complete RECCE Management System (RMS) design for the Rapid Prototype.
- (U) (\$11,900) SHARP Engineering Development Model(EDM) development. Complete pod design for EMD phase and fabricate 3 EDMs.
- (U) (\$9,000) Procure a SAR system design that can be incorporated in a SHARP Pod. (The SAR system to be incorporated is an NDI system.) Upgrade the SHARP design to incorporate a side-looking radome and the avionics to support the SAR system design. Develop an integration plan to incorporate the SAR stand alone system on the F/A-18E. Develop F/A-18C/D SCS software so a SHARP pod can be flown on a C/D Aircraft.

#### (U) FY2001 PLAN

- (U) (1,000) Program Management to coordinate development activities during the EMD Phase of the Program.
- (U) (1,195) Systems engineering to develop EDM pods, design/develop the (software/hardware) interface to the F/A-18 aircraft. Coordinate with other subsystems (F/A-18 EW, Weapons, and Radar), to ensure system compatibility. Coordinate with ground station activities to ensure compatibility.
- (U) (9,400) SHARP EDM development. Upgrade design as needed to support pod qualification. Complete pod design for EMD phase and fabricate 2 EDM pods, Integrate Weapons Replaceable Assembly (WRA)'s and begin initial aircraft integration on F/A-18 E/F aircraft.
- (U) (6,000) Procure 2 additional sensors for EMD phase.
- (U) (600) F/A-18 SCS software. Integration and test of the SHARP subsystems.
- (U) (4,076) Complete coding for RMS to support integration of the EMD phase. Begin BIT software development and testing, and begin integration to the F/A-18E/F SCS.
- (U) (3,000) Integration and test of the SHARP EDM pod. Perform initial E3 testing, Carrier Suitability testing and Initial Operation Testing to support Low Rate Initial Production.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0305207N**      **PROJECT NUMBER: E2673**  
**PROGRAM ELEMENT TITLE: DARP Special Project Aircraft**      **PROJECT TITLE: F/A-18 Tactical Reconnaissance**

**(U) B. PROGRAM CHANGE SUMMARY**

(U)      Program Change Summary for total P.E.

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	*29,845	*30,558	25,588
(U) Appropriated Value:	30,000	39,558	
(U) Adjustments from President's Budget:	-136	+8,782	-317
(U) FY 2001 President's Budget Submission:	*29,709	*39,340	25,271

\*Was executed under PE 0305207N, project R2673

**(U) CHANGE SUMMARY EXPLANATION:**

(U) Funding: The FY 1999 net decrease of \$136 thousand reflects inflation adjustments. The FY 2000 net increase of \$8,782 thousand reflects a \$218 thousand reduction for Across-the-Board Congressional rescission, and a \$9,000 thousand Congressional plus-up for Sharp System Synthetic Aperture Radar (SAR) module development. The FY2001 net decrease of \$317 thousand reflects a decrease of \$282 thousand for reprioritization of requirements within the Navy and a decrease of \$35 thousand for Strategic Sourcing Planning and Navy Working Capital Fund rate adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

**(U) C. OTHER PROGRAM FUNDING SUMMARY:**  
**(U) PROCUREMENT FUNDING:**

<b>(U) COST: (Dollars in Thousands)</b>		<b>Total</b>				
<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>
F/A-18E/F Fighter (Hornet) APN-1 (Ancillary Equipment)	0	0	0	12,911	21,828	33,454
					32,926	101,119

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## EXHIBIT FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305207N

PROGRAM ELEMENT TITLE: DARP Special Project Aircraft

PROJECT NUMBER: E2673

PROJECT TITLE: F/A-18 Tactical  
Reconnaissance

### (U) RELATED RDT&E:

- (U) PE 0305206N (Airborne Reconnaissance Advance Development)
- (U) PE 0204136N (F/A-18 Squadrons)
- (U) PE 0305208N (JSIPS)

### (U) D. ACQUISITION STRATEGY:

The SHARP program consists of 3 separate procurements:

1. The pod will be procured with an order on a Cost Plus Fixed-Fee (CPFF)/IDIQ contract to Raytheon Indy.
2. The sensor will be procured competitively with a Fixed-Price Incentive (FPI) or Cost Plus Fixed-Fee CPFF contract .
3. The digital recorder will be procured competitively with a FPI or CPFF contract.

### (U) E. SCHEDULE PROFILE:

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>To Complete</u>
(U) Program Milestones		3Q/00 MS-II		2Q/03 – MS III
(U) Engineering Milestones	4Q/99 PDR	1Q/00 CDR	4Q/01 Prototype Complete	
(U) T&E Milestones				1Q/03 - TECHEVAL 4Q/03 - OPEVAL
(U) Contract Milestones		2Q/00 EMD Contract	2Q/01 Sensor Award	

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## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305207N

PROJECT NUMBER: E2673

PROGRAM ELEMENT TITLE: DARP Special Project Aircraft

PROJECT TITLE: F/A-18 Tactical Reconnaissance

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total* Prior Yrs Cost</u>	<u>FY 1999* Cost</u>	<u>FY 1999** Award Date</u>	<u>FY 2000** Cost</u>	<u>FY 2000** Award Date</u>	<u>FY2001 Cost</u>	<u>FY 2001*** Award Date</u>	<u>Cost to*** Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
POD Development/Integration	SS/CPFF	RAYTHEON, Indianapolis, IN	29	14,000	7/99	11,500	01/00	9,400	10/00	0	34,929	34,929
		LMTS,										
Prototype SensorWRAS	C/CS	Akron, OH	0	4,500	5/99					0	4,500	4,500
		CAI, Recon										
Prototype SensorWRAS	CPFF	Optical, Inc. Barrington, IL	0	1,900	5/99					0	1,900	1,900
Prototype SensorWRAS	TBD	TBD						6,000	02/01	4,000	10,000	10,000
Procure SAR System	TBD	TBD				2,500	07/00				2,500	2,500
Upgrade Pod System	TBD	RAYTHEON, Indianapolis, IN				1,500	06/00				1,500	1,500
Software Engineering Development	WX	NAWCWD China Lake, CA	1,564	1,700	02/99	12,482	10/99	4,476	10/00	5,518	25,740	
		NRL, DC	0	4,364	02/99	4,600	10/99				8,964	
Misc. Product Development	WX	NAWCWD China Lake, CA		1,500	02/99	233	10/99	495	10/00	1,000	3,228	
		Lakehurst, NJ				200	10/99	700	10/00	2,000	2,900	
	WX	NRL, DC	0			1,500	10/99				1,500	
<b>Subtotal Project Development</b>			<b>1,593</b>	<b>27,964</b>		<b>34,515</b>		<b>21,071</b>		<b>12,518</b>	<b>97,661</b>	
<b>Subtotal Support Not Applicable</b>			<b>0</b>	<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>	<b>0</b>	

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Exhibit R-3, Cost Analysis  
(Exhibit R-3 Page 7 of 8)

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305207N

PROJECT NUMBER: E2673

PROGRAM ELEMENT TITLE: DARP Special Project Aircraft

PROJECT TITLE: F/A-18 Tactical Reconnaissance

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total* Prior Yrs Cost	FY 1999* Cost	FY 1999** Award Date	FY 2000* Cost	FY 2000** Award Date	FY2001 Cost	FY2001*** Award Date	Cost to*** Complete	Total Cost	Target Value of Contract
<u>Test &amp; Evaluation Organizations</u>												
Product Test & Integration	WX	NAWCAD Patuxent River, MD	1,023	745	02/99	3,800	10/99	3,210	10/00	10,600	19,378	
<b>Subtotal Product Test &amp; Evaluation</b>			<b>1,023</b>	<b>745</b>		<b>3,800</b>		<b>3,210</b>		<b>10,600</b>	<b>19,378</b>	
Contractor Support/Travel Misc.	Various	NAVAIR Patuxent River, MD	201	1,000	02/99	1,025	02/99	990	10/00	1,000	4,216	
<b>Subtotal Management</b>			<b>201</b>	<b>1,000</b>		<b>1,025</b>		<b>990</b>		<b>1,000</b>	<b>4,216</b>	
<b>Total Cost</b>			<b>2,817</b>	<b>29,709</b>		<b>39,340</b>		<b>25,271</b>		<b>24,118</b>	<b>121,255</b>	

\* Executed under PE 0204136N Project E2350  
 \*\* Executed under PE 0305207N Project R2673  
 \*\*\* Executed under PE 0305207N Project E2673

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**EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

DATE: FEBRUARY 2000

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0305208N**  
**PROGRAM ELEMENT TITLE: DISTRIBUTED COMMON GROUND SYSTEMS (DCGS)**

**(U) COST: (Dollars in Thousands)**

Project Number & Title	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To	Total
A2174 CIGSS ( JSIPS-N)	<u>Actual</u>	<u>Budget</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	<u>Program</u>
	\$4,933*	\$5,552	\$4,482	\$4,478	\$4,530	\$4,575	\$4,529	Continuing	Continuing
TOTAL	\$4,933*	\$5,552	\$4,482	\$4,478	\$4,530	\$4,575	\$4,529	Continuing	Continuing

\* FY 1999 budget reflects a Congressional Add of \$4,966 for Common Imagery Ground/Surface Systems executed under project unit A2677, revised by \$11k for revised economic assumptions and \$22k for Congressional reductions.

**(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:**

The Joint Service Imagery Processing System – Navy (JSIPS-N) is the Navy's portion of the Distributed Common Ground System (DCGS) which is a cooperative effort between the services, agencies, and DoD to provide systems capable of receiving, processing, exploiting, and disseminating data from airborne and national reconnaissance platforms. DCGS is further subdivided into systems which process, exploit, and disseminate Measurements Analysis and Signatures Intelligence (MASINT) data, Signals Intelligence (SIGINT) data, Multi-Intelligence Reconnaissance data, and Imagery data. Cooperative imagery processing systems are collected under the general heading Common Imagery Ground/Surface Systems (CIGSS). JSIPS-N is the Navy CIGSS component.

JSIPS-N has the capability to receive, process, exploit, store and disseminate imagery, imagery-derived products and imagery intelligence (IMINT) reports based on multi-source from multiple inputs. The primary mission of JSIPS-N is to assist strike planners, tactical aviators, and Marine Corps amphibious planners in the delivery of precision ordnance (including Tomahawk Cruise Missiles) on target.

JSIPS-N includes three major components, the Softcopy Exploitation Segment (SES) consisting of the Digital Imagery Workstation Suite Afloat (DIWSA) and the Precision Targeting Workstation (PTW), the National Input Segment (NIS) and the Tactical Input Segment (TIS). JSIPS-N is being installed onboard aircraft carriers (CV/CVN), amphibious assault ships (LHA/LHD), select fleet flagships (AGF/LCC) and shore sites.

Secondary missions of the system are to provide near-real-time imagery and support to fleet intelligence assets, Special Operations Forces, and to support primary exploitation and dissemination of tactical organic and theater IMINT products.

**(U) JUSTIFICATION FOR BUDGET ACTIVITY:** This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing operational systems

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0305208N      PROJECT NUMBER: A2174  
 PROGRAM ELEMENT TITLE: DISTRIBUTED COMMON GROUND      PROJECT TITLE: JOINT SERVICE IMAGERY  
 SYSTEMS (DCGS)      PROCESSING SYSTEMS

(U) COST: (Dollars in Thousands)

Project Number & Title	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To	Total
A2174 CIGSS (JSIPS-N)	Actual \$4,933*	Budget \$5,552	Estimate \$4,482	Estimate \$4,478	Estimate \$4,530	Estimate \$4,575	Estimate \$4,529	Complete Continuing	Program Continuing
TOTAL	\$4,933*	\$5,552	\$4,482	\$4,478	\$4,530	\$4,575	\$4,529	Continuing	Continuing

\* FY 1999 budget reflects a Congressional Add of \$4,966 for Common Imagery Ground/Surface Systems executed under project unit A2677, revised by \$11k for revised economic assumptions and \$22 for Congressional reductions.

### (U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Joint Services Imagery Processing System - Navy (JSIPS-N) is the Navy's portion of the Distributed Common Ground System (DCGS) which is a cooperative effort between the services, agencies, and DoD to provide systems capable of receiving, processing, exploiting, and disseminating data from airborne and national reconnaissance platforms. DCGS is further subdivided into systems which process, exploit, and disseminate Measurements Analysis and Signatures Intelligence (MASINT) data, Signals Intelligence (SIGINT) data, Multi-Intelligence Reconnaissance data, and Imagery data. Cooperative imagery processing systems are collected under the general heading Common Imagery Ground/Surface Systems (CIGSS). JSIPS-N is the Navy CIGSS component.

JSIPS-N has the capability to receive, process, exploit, store and disseminate imagery, imagery-derived products and imagery intelligence (IMINT) reports based on multi-source from multiple inputs. The primary mission of JSIPS-N is to assist strike planners, tactical aviators, and Marine Corps amphibious planners in the delivery of precision ordnance (including Tomahawk Cruise Missiles) on target.

JSIPS-N includes three major components, the Softcopy Exploitation Segment (SES) consisting of the Digital Imagery Workstation Suite Afloat (DIWSA) and the Precision Targeting Workstation (PTW), the National Input Segment (NIS) and the Tactical Input Segment (TIS). JSIPS-N is being installed onboard aircraft carriers (CV/CVN), amphibious assault ships (LHA/LHD), select fleet flag ships (AGF/LCC) and shore sites.

Secondary missions of the system are to provide near-real-time imagery and support to fleet intelligence assets, Special Operations Forces, and to support primary exploitation and dissemination of tactical organic and theater IMINT products.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: FEBRUARY 2000**

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0305208N**      **PROJECT NUMBER: A2174**  
**PROGRAM ELEMENT TITLE: DISTRIBUTED COMMON GROUND**      **PROJECT TITLE: JOINT SERVICE**  
**SYSTEMS (DCGS)**      **IMAGERY ROCESSING**  
**SYSTEMS**

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

**1. FY 1999 ACCOMPLISHMENTS:**

- (U) (\$4,358) Continued JSIPS-N System Engineering including Precision Targeting Workstation, Classified Communications, JSIPS-N Concentrator Architecture and Imagery Exploitation Software Segment.
- (U) (\$500) Performed Collaborative Contingency Targeting and Precision Guided Missile/Support Activity efforts.
- (U) (\$75) Continued Test and Evaluation Support.

**2. FY 2000 PLAN:**

- (U) (\$3,769) Continue JSIPS-N System Engineering including Precision Targeting Workstation, Classified Communications, JSIPS-N Concentrator Architecture and Imagery Exploitation Software Segment.
- (U) (\$919) Continue Share Reconnaissance Pod (SHARP)/Tactical Input Segment (TIS) Systems Engineering and Integration.
- (U) (\$764) Perform Collaborative Contingency Targeting and Precision Guided Missile/Support Activity efforts.
- (U) (\$100) Continue Test and Evaluation Support.

**3. FY 2001 PLAN:**

- (U) (\$4,132) Continue JSIPS-N System Engineering including Precision Targeting Workstation, Classified Communications, JSIPS-N Concentrator Architecture and Imagery Exploitation Software Segment.
- (U) (\$250) Perform Collaborative Contingency Targeting and Precision Guided Missile/Support Activity efforts.
- (U) (\$100) Continue Test and Evaluation Support.

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0305208N      PROJECT NUMBER: A2174  
 PROGRAM ELEMENT TITLE: DISTRIBUTED COMMON GROUND      PROJECT TITLE: JOINT SERVICE  
 SYSTEMS (DCGS)      IMAGERY      SYSTEMS

### PROCESSING

#### (U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	\$4,955	\$5,583	\$6,042
(U) Appropriated Value:	\$4,966	\$5,583	0
(U) Adjustments from President's Budget:	-\$22	-\$31	-\$1,560
(U) FY2001 President's Budget Submit	\$4,933	\$5,552	\$4,482

#### CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 reflects a \$22 thousand decrease for revised economic assumptions. The FY 2000 reflects a \$31 thousand decrease for an Across-the-Board Congressional rescission. FY 2001 reflects a \$1,476 thousand decrease associated with realigning funding to the Marine Corps JSIPS Tactical Exploitation Group program to more accurately reflect program intent, \$42 thousand decrease associated with minor program reductions, and a \$43 thousand decrease for revised economic assumptions.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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## EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 7  
PROGRAM ELEMENT TITLE: DISTRIBUTED COMMON GROUND  
PROJECT NUMBER: A2174  
PROJECT TITLE: JOINT SERVICE

### IMAGERY

#### SYSTEMS (DCGS)

#### (U) C. OTHER PROGRAM FUNDING SUMMARY (Dollars in Thousands)

Appn OPN	FY 1999 Actual	FY 2000 Budget	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Total	
								Complete	Program
	\$65,228	\$41,025	\$47,022	\$45,791	\$44,564	\$72,593	\$73,617	Continuing	Continuing

### Related RDT&E

Not applicable.

#### (U) D. ACQUISITION STRATEGY:

The production system consists of three elements, the Softcopy Exploitation System (SES) consisting of the Digital Imagery Workstation Suite Afloat (DIWSA) and the Precision Targeting Workstation (PTW), the National Input Segment (NIS) and Tactical Input Segment (TIS). The DIWSA is already in full rate co-production with other programs, most notably Tomahawk's mission planning systems. The NIS is also in full rate production and supplied as Government Furnished Equipment (GFE) by the National Imagery and Mapping Agency (NIMA SDD). The TIS is acquired from the Air Force Electronic Systems Center (ESC) at Hanscom AFB. The TIS includes a Common Imagery Processor (CIP) that is supplied as GFE to the integrating contractor. The system integrator for the Navy system is the Space and Naval Warfare Systems Command.

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**EXHIBIT R-2a, FY 2001 RDT&E, N BUDGET PROJECT JUSTIFICATION SHEET**

DATE: FEBRUARY 2000

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT:**

**0305208N**

**PROJECT NUMBER: A2174**

PROGRAM ELEMENT TITLE: DISTRIBUTED COMMON GROUND SYSTEMS (DCGS)	PROJECT TITLE: JOINT SERVICE IMAGERY PROCESSING SYSTEMS
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## E. SCHEDULE PROFILE

SYSTEM ELEMENT	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03
DIWSA								
NIS								
TIS								
• DT&E								
• OT&E								

R-1 Item No. 193

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# UNCLASSIFIED

## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305208N

PROJECT NUMBER: A2174

PROGRAM ELEMENT TITLE: DISTRIBUTED COMMON GROUND SYSTEMS (DCGS)  
PROJECT TITLE: JOINT SERVICE IMAGERY PROCESSING SYSTEMS

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
Primary Hardware Development												
Hardware Development						0						
Systems Engineering	MIPR	NAWC, China Lake, CA		0		550	2/00	760	2/01	CONT	CONT	
Economy Act		NRL, Washington DC		0		475	5/00	904	5/01	CONT	CONT	
SS/CPFF		Mitre, Vienna VA		700	2/99	800	2/00	800	3/01	CONT	CONT	
MIPR		NRO, Wash, DC		2,328	3/99	2,827	3/00	1,118	3/01	CONT	CONT	
MIPR		OSO, Wash, DC		750	5/99	800	5/00	800	5/01	CONT	CONT	
MIPR		Rome Lab, NY		1,080	6/99	0		0		0	1,080	
<b>Subtotal Project Development</b>				<b>\$4,858</b>		<b>\$5,452</b>		<b>\$4,382</b>				

Note: FY 1998 budget for this item was submitted as part of the RDT&E Defense-Wide Program, Distributed Common Ground Systems (DCGS), PE 0305208D8Z. OSD Program Decision Memorandum, of 18 August 1998, transferred FY00-05 funding for this program to the services.

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**EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS**

**DATE: FEBRUARY 2000**

**BUDGET ACTIVITY: 7**

**PROGRAM ELEMENT: 0305208N**

**PROJECT NUMBER: A2174**

**PROGRAM ELEMENT TITLE: DISTRIBUTED COMMON GROUND  
SYSTEMS (DCGS)**

**PROJECT TITLE: JOINT SERVICE IMAGERY  
PROCESSING SYSTEMS**

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
Developmental Test & Evaluation	WX	COMOPTEVFOR, Norfolk, VA		75	6/99	100	6/00	100	6/01	CONT	CONT	CONT
<b>Subtotal Test &amp; Evaluation</b>			<b>75</b>			<b>100</b>		<b>100</b>				

**Subtotal Management**

**Remarks:** None.

**Total Cost**

**See Note  
Below**

**\$4,933**

**\$5,552**

**\$4,482**

**CONT**

**CONT**

Note: FY 1998 budget for this item was submitted as part of the RDT&E Defense-Wide Program, Distributed Common Ground Systems (DCGS), PE 0305208D8Z. OSD Program Decision Memorandum, of 18 August 1998, transferred FY00-05 funding for this program to the services.

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FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2000

UDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305927N  
PROGRAM ELEMENT TITLE: Navy Space Surveillance

U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
0125 Naval Space Surveillance	378	708	2,038	2,081	1,570	752	769	CONT.	CONT.
2809 RESIC	-	1,000	-	-	-	-	-	1,000	1,000
TOTAL	378	1,708	2,038	2,081	1,570	752	769	CONT.	CONT.

U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Naval Space Surveillance Fence is an integral component of the S. Space Command Space Surveillance Network. This system provides continuous surveillance and unaltered detection of space objects crossing the Continental United States. The fence is also the only space surveillance system which provides satellite vulnerability and space control data to the fleet. It is a multistatic continuous wave radar fence consisting of three transmitter sites, six receiver sites, and a computation/communication center. The Alternate Space Control role assigned by S. Commander in Chief Space (USCINCSpace), requires that the Naval Space Command Mission System maintain functional equivalence with the USCINCSpace Space Control Center and receive, process, and distribute data from 26 surveillance sites. The increase in funding FY00 and out supports this role and the research and development of highpowered transmitters and their system component parts for the next generation fence system to reduce risk in the implementation phase.

U) Project R2809 is a Congressional Plus-Up in support of Remote Earth Sensing Information Center. The Hyperspectral Integrated Tools and Techniques (HITT) initiative is the single hyperspectral project focused on integrating the tools and techniques necessary for accurate geo-locate hyperspectral sensor data and produce timely information to support warfighter

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Budget Item Justification  
(Exhibit R-2, page 1 of 7)

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FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

UDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305927N  
PROGRAM ELEMENT TITLE: Navy Space Surveillance

ituational awareness, mission planning, and execution. The HITT project's Integration of proven commercial off-the-shelf technology will rapidly provide techniques and tools for turning this important 21st century sensor data source into usable arfighting information. The Navy's success with the HITT project should put the Navy in a position to lead all Services and gencies conducting sensor research and development by ensuring they all have access to the tools and techniques necessary to urn the data they collect into information vital to the warfighter.

U)JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses ngineering and manufacturing development for upgrading existing operational systems.

## U) PROGRAM CHANGE SUMMARY FOR TOTAL PE:

	FY 1999	FY 2000	FY 2001
(U) FY 2000 President's Budget:	398	712	724
(U) Appropriated Value:		712	
(U) Adjustments from PRESBUDG:			
(U) SBIR/STTR Adjustment	-10		
(U) Various Rate Adjustments	-2		-12
(U) Execution Adjustments	-8	-4	
(U) Program Adjustments			1326
(U) Congressional Plus-Up (R2809)		1,000	
(U) FY 2001 PRESBUDG Submission	378	1,708	2,038

## (U) CHANGE SUMMARY EXPLANATION:

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Budget Item Justification  
(Exhibit R-2, page 2 of 7)

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FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305927N

PROGRAM ELEMENT TITLE: Navy Space Surveillance

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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Budget Item Justification  
(Exhibit R-2, page 3 of 7)

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DATE: February 2000

FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305927N  
PROGRAM ELEMENT TITLE: Naval Space Surveillance

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0125 Naval Space Surveillance	378	708	2,038	2,081	1,570	752	769	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project supports the Naval Space Surveillance Fence, an integral component of the U. S. Space Command Space Surveillance Network. This system provides continuous surveillance and unaltered detection of space objects crossing the Continental United States. The fence is also the only space surveillance system which provides satellite vulnerability and space control data to the fleet. It is a multistatic continuous wave radar fence consisting of three transmitter sites, six receiver sites, and a computation/communication center. The Alternate Space Control role assigned by U.S. Commander in Chief Space (USCINCSpace), requires that the Naval Space Command Mission System maintain functional equivalence with the USCINCSpace Space Control Center and receive, process, and distribute data from 26 surveillance sites.

## (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 ACCOMPLISHMENTS:
  - (U) (\$179) Evaluated tradeoffs in prototype S band feed assembly as part of a large antenna array.
  - (U) (\$100) Evaluated impacts to current system of S band implementation.
  - (U) (\$ 99) Demonstrate impact of high volume (10-100X) processing on multiple site integration.
2. (U) FY 2000 PLAN:

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Budget Item Justification  
(Exhibit R-2, page (4 of 7))

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FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305927N

PROGRAM ELEMENT TITLE: Naval Space Surveillance

- (U) (\$436) Study system designing trade-offs for S-band operations.
- (U) (\$150) Verify high volume processing algorithms.
- (U) (\$122) Study improved drag processing for low orbits.

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Budget Item Justification  
(Exhibit R-2, page (5 of 7))

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BUDGET ACTIVITY: 7      FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET      DATE: February 2000  
PROGRAM ELEMENT: 0305927N      PROJECT: R0125  
PROGRAM ELEMENT TITLE: Naval Space Surveillance      PROJECT TITLE: Naval Space Surveillance

3. (U) FY 2001 PLAN:
- (U) (\$ 150) Demonstrate S-band transmitter antenna.
  - (U) (\$ 500) Develop prototype RF system for S-Band fence.
  - (U) (\$ 85) Study integrated communications for remote operations.
  - (U) (\$1,303) Studies to reduce technical risks of the S-Band sensor system development and numerically intensive processing.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: Not applicable.

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Budget Item Justification  
(Exhibit R-2, page (6 of 7))

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FY 2001 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305927N

PROJECT: R0125

PROGRAM ELEMENT TITLE: Naval Space Surveillance

PROJECT TITLE: Naval Space Surveillance

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>
a. Project Management	15	20	82
b. Product Development	363	688	1,956
Total	378	708	2,038

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PE/Project Cost Breakdown  
(Exhibit R3, page 7 of 7)

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Exhibit R-2, RDT&E Budget Item Justification										Date: February 2000
APPROPRIATION/BUDGET ACTIVITY										
RDT&E,N										
Activity 7										
R-1 ITEM NOMENCLATURE										
Program Element (PE) Name and No. Integrated Broadcast Service 0305972N										
COST (\$ in Millions)	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	Cost to Complete	Total Cost
Total PE Cost	0	14,480	0	0	0	0	0	0	CONT	CONT
Z2006 Integrated Broadcast Service	0	14,480	0	0	0	0	0	0	CONT	CONT
Quantity of RDT&E Articles	0	2	0	0	0	0	0	0		
A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: IBS provides warfighters with critical and highly perishable intelligence and information in a single, correlated picture via a near-real-time, integrated dissemination architecture. IBS consolidates existing intelligence broadcast systems into a common-format, common-terminal, theater-tailored architecture. The IBS design incorporates new functionality in broadcast and information management, a new message format, and a new receiver. It fields five Information Management Elements to geographic CINCs that perform requirements as set forth in the Joint Operational Requirements Document.										
<ul style="list-style-type: none"> <li>• Accept data from dissimilar, geographically-dispersed data sources including airborne, space-based, shipborne and ground SIGINT, radar and infrared sensors.</li> <li>• Transmit intelligence and information to end users equipped with JTT or terminals which incorporate the CIBS-M.</li> <li>• Disseminate theater oriented, based, and focused intelligence and information, based on user generated and CINC validated dissemination priorities.</li> <li>• Disseminate intelligence and information over various communications paths, based on the communications available to the end user.</li> </ul>										
(U) PROGRAM ACCOMPLISHMENTS AND PLANS										
(U) FY 1999 ACCOMPLISHMENTS										
<ul style="list-style-type: none"> <li>• (U) (\$1,300) Maintain a Program Management Office, including program supervision, finance and acquisition strategy development</li> <li>• (U) (\$3,650) Perform System Engineering, including design of message format, maintenance of architectures, and system configuration control</li> <li>• (U) (\$8,416) Design, build and field the initial Information Management Element (IME) (Spiral #1)</li> <li>• (U)(\$ ,800) Test initial IME in CUBE and CANX before fielding in Pacific Command (PACOM)</li> <li>• (U) (\$ ,314) AMB Development</li> </ul>										
(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is in budget activity 7 because it includes demonstrating and validating the use of technologies to create an operational integrated broadcast service.										
B. Program Change Summary:										
(U) Funding: FY1999 adjustments due to Revised Economic Assumptions (-034) and Inflation Savings (-.066).										

Exhibit R-2, RDT&E Budget Item Justification											Date: February 2000
C. Other Program Funding Summary											
(U) Significant Program Changes: USN received \$24.9M in a Congressional transfer of IBS and IBS legacy funds in the FY 1999 budget: \$14.480M in RDT&E, \$10.228M in OPN. FY 1999 adjustments (-.034) Revised Economic Assumptions and (-.066) Inflation Savings.											
*Note: Program transfer to Air Force starting in FY2000. Program transferred to Navy, from Legacy Systems via IPDM.											
D. Other Program Funding Summary (\$ in Millions)											
(U) OPN/LI 305600	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Total Cost		
	0	10.228	0	0	0	0	0	0	10.228		
(U) E. Acquisition Strategy IBS will use a spiral development program to create a common dissemination architecture. Systems and technology will be contracted for under a competitive Request for Proposal (RFP) process.											
(U) F. Schedule Profile											
(U) Master Acquisition Plan	FY 1998			FY 1999			FY 2000			FY 2001	
(U) Spiral 1	1	2	3	4	1	2	3	4	1	2	3
(U) - Design				*							4
(U) - Development											
(U) - Accreditation Efforts Begin				*							
(U) - CANX/CUBE Activities Begin				*							
(U) - Product Build									X		
(U) - PACOM Preparations									X		
(U) - Spiral Replan									X		

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EXHIBIT R-2 FY2001 RDT&E, N BUDGET ITEM JUSTIFICATION

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0308601N

PROGRAM ELEMENT TITLE: Naval Modeling and Simulation

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2222 Naval Modeling & Simulation	0	12,054	9,106	8,418	8,645	11,576	12,030	Cont	Cont

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Funds the efforts of Navy Modeling and Simulation (M&S) Management Office and the Department of the Navy Technical Support Group (TSG). Supports technical and management initiatives directed by Congress, DoD and SECNAV with the aim of bringing organization and focus to the development and use of M&S tools throughout Navy and DoD. It provides a central agency for the formulation and implementation of policy and guidance in M&S; represents Navy interests in Joint/other Agency. Funds efforts to define and coordinate execution of a Navy M&S program to evolve an interoperable and reusable core M&S capability consistent with the M&S technical framework prescribed by DoD. Efforts are organized around 4 product areas: (1) Engineering Studies and Analysis, to define the feasibility and applicability of proposed standards to Navy and to investigate service unique requirements for standards or guidance; (2) Products and Services, to develop the policy, standards, and common tools and services necessary to guide more efficient development and use of M&S across Navy; this includes development and management of the Navy M&S Information System (NMSIS), Navy counterpart to the DOD M&S Resource Repository, to provide a central M&S information resource to reduce stovepiped development, promote tool reuse and support informed M&S investment decisions; (3) M&S Quality Assurance Program, to establish and manage a disciplined process of model verification, validation and accreditation (VV&A) required by current directives; (4) Simulation Experiments, to test distributive simulation technology in fleet exercises, experiments, and pilot efforts which demonstrate and examine the value and limitations of proposed standards (such as High Level Architecture, HLA, and Simulation Based Acquisition, SBA) to mission and program requirements.

Note: In FY 2000 a Technical Change moves the Naval Modeling and Simulation X2222 Project from Program Element 0605853N to Program Element 0308601N in order to more accurately describe the Naval Modeling and Simulation Project.

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EXHIBIT R-2 FY2001 RDT&E, N BUDGET ITEM JUSTIFICATION

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0308601N

PROGRAM ELEMENT TITLE: Naval Modeling and Simulation

B. (U) PROGRAM CHANGE SUMMARY: FY 99 (SEE PE0605853N); FY 2000 Increase \$2,500K SPAWAR Modeling & Simulation Initiative; Decrease \$-67K Congressional Reduction, \$176K Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638; FY 2001 Decrease \$-416K MUOS; SSP (Contract) -\$8K, NWCF Rates - Naval Research Laboratory -\$51K, NWCF Rates - NCCOSC -\$4K, NWCF Rates - NUWC +\$16K, NWCF Rates - NAWC +\$5K, SSP-NUWC Functionality Assessment -\$1K, SSP-NUWC Contract Efficiencies -\$3K, SSP-NAWC A-76 (Cost Reimb Savings) -\$11K, SSP-NAWC Functionality Assessment (Cost Reimb) -\$11K, ICC 0610 NSWC +\$2K, ICC 0612 NUWC +\$1K, ICC 0614 SPAWAR +\$1K, Nonpay Purchase Inflation -\$67K, Active Navy Ops -\$24K.

(U) OTHER PROGRAM FUNDING SUMMARY:

FY1999	FY2000	FY2001
O&M,N PE0204662N/1C1C (Partial)		
634	1,219	1,077

(SEE PE 0605853N)

(U) RELATED RDT&E: Not applicable.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 ACCOMPLISHMENTS:

(U) N/A See PE0605853N

2. (U) FY 2000 PLAN:

- (U) (\$2,908) Engineering Studies and Analysis: Conduct engineering studies and analysis aimed at determining the feasibility and applicability of proposed standards or technical approaches to Navy and at investigating service unique requirements for standards or guidance. Individual study thrusts will focus on developing or evaluating approaches to optimize training, assessments and acquisition functional/mission objectives through more efficient development and use of M&S. Develop methodologies and standards for modeling communication networks and information systems with the overarching objective of facilitating the development of a core, reusable, communications M&S capability which supports the full range of architecture and engineering design and analysis requirements across Navy. Provide a Modeling and Simulation

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EXHIBIT R-2 FY2001 RDT&E, N BUDGET ITEM JUSTIFICATION

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0308601N

PROGRAM ELEMENT TITLE: Naval Modeling and Simulation

degree program through the Naval Postgraduate School, Modeling, Virtual Environments and Simulation (MOVES) curriculum.

- (U) (\$3,641) Products and Services: Continue development of common services, tools, and data bases. Develop and enhance the Navy Modeling and Simulation Information System (NMSIS), through an evolutionary process, integrating standards, standard models, standard data and connectivity to support all Naval assessments, training, acquisition and operational communities. Manage and maintain the Navy Modeling and Simulation Information System (NMSIS), as a central M&S information resource to reduce stovepiped development, promote standardization and reuse and support informed M&S investment decision making across Navy. Provide the necessary planning and coordination of M&S efforts across the Navy M&S Functional Areas, other Services, OSD, Joint Staff, and other agencies to develop policies and procedures necessary for M&S standardization within the Navy. Provide annual updates to the Naval M&S Catalog, Master Plan, and Investment Strategy.
  - (U) (\$1,235) M&S Quality Assurance Program: Continue to implement and manage the M&S Quality Assurance development of the Verification, Validation, and Accreditation (VV&A) process and guidelines for modeling, simulation, and data. Continue implementation of the VV&A process and review on both new and legacy M&S plans and reports. Develop and maintain the Naval M&S VV&A repository. Establish and implement a VV&A training curriculum for developers and accreditors. Provide annual VV&A assessment to the CNO.
  - (U) (\$4,270) Simulation Experiments: Support Fleet Exercise simulation experiments and the application of distributed simulation to a wide variety of operational, research and development, training, test and evaluation exercises. Develop and integrate appropriate models and simulations into the Fleet Battle Experiments, FBEs. Develop a series of simulation projects to test and evolve the standards for models, interfaces, data, and tools necessary to enable the seamless access and use of operationally relevant M&S to support the range of Navy training, warfare assessments and acquisition requirements.
3. (U) FY 2001 PLAN:
- (U) (\$1,713) Engineering Studies and Analysis: Conduct engineering studies and analysis aimed at determining the feasibility and applicability of proposed standards or technical approaches to Navy and at investigating service unique requirements for standards or guidance. Individual study thrusts will focus on developing or evaluating approaches to optimize training,

R-1 Shopping List - Item No 196-3 of 196-6

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Exhibit R-2, RDT&E Budget Item Justification

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EXHIBIT R-2 FY2001 RDT&E, N BUDGET ITEM JUSTIFICATION

DATE: FEBRUARY 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0308601N

PROGRAM ELEMENT TITLE: Naval Modeling and Simulation

assessments and acquisition functional/mission objectives through more efficient development and use of M&S. Develop methodologies and standards that will result in model and data reusability and interoperability through the formulation of a technical framework. These standards will support the full range of architecture and engineering design and analysis requirements across Navy. Provide a Modeling and Simulation degree program through the Naval Postgraduate School, Modeling, Virtual Environments and Simulation (MOVES) curriculum.

- (U) (\$3,183) Products and Services: Continue development of common services, tools, and data bases. Develop and enhance the Navy Modeling and Simulation Information System (NMSIS), through an evolutionary process, integrating standards, standard models, standard data and connectivity to support all Naval assessments, training, acquisition and operational communities. Manage and maintain the Navy Modeling and Simulation Information System (NMSIS), as a central M&S information resource to reduce stovepiped development, promote standardization and reuse and support informed M&S investment decision making across Navy. Provide the necessary planning and coordination of M&S efforts across the Navy M&S Functional Areas, other Services, OSD, Joint Staff, and other agencies to develop policies and procedures necessary for M&S standardization within the Navy. Provide annual updates to the Naval M&S Catalog, Master Plan, and Investment Strategy.
- (U) (\$790) M&S Quality Assurance Program: Continue to implement and manage the M&S Quality Assurance development of the Verification, Validation, and Accreditation (VV&A) process and guidelines for modeling, simulation, and data. Continue to review both new and legacy M&S VV&A plans and reports. Develop and maintain the Naval M&S VV&A repository. Establish and implement a VV&A training curriculum for developers and accreditors. Provide annual VV&A assessment to the CNO.
- (U) (\$3,420) Simulation Experiments: Support Fleet exercises and experiments through the application of distributed simulation to a wide variety of operational, research and development, training, test and evaluation exercises. Develop and integrate appropriate models and simulations into the Fleet Battle Experiments, FBEs. Develop a series of simulation projects to test and evolve the standards for models, interfaces, data, and tools necessary to enable the seamless access and use of operationally relevant M&S to support the range of Navy training, warfare assessments and acquisition requirements.

C. (U) SCHEDULE PROFILE: Not applicable.



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## EXHIBIT R-3, FY 2001 RDT&amp;E,N PROJECT COST ANALYSIS

Exhibit R-3 Cost Analysis (page 1)				Date FEB 2000								
APPROPRIATION/BUDGET ACTIVITY: 7				PROJECT NAME AND NUMBER: Modeling & Simulation, X2222								
PROGRAM ELEMENT: 0308601N												
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY-99 Cost	FY-99 Award Date	FY-00 Cost	FY-00 Award Date	FY-01 Cost	FY-01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Navy M&S Info Sys Development	Various	Various	N/A	N/A	N/A	1768	TBD	1494	TBD	Cont.	Cont.	Cont.
Quality Assurance	Various	Various	N/A	N/A	N/A	1235	TBD	790	TBD	Cont.	Cont.	Cont.
Subtotal Product Development						3003		2284		Cont.	Cont.	Cont.
Remarks:												
M&S Services	Various	Various	N/A	N/A	N/A	1873	TBD	1689	TBD	Cont.	Cont.	Cont.
Subtotal Support						1873		1689		Cont.	Cont.	Cont.
Remarks												

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EXHIBIT R-3, FY 2001 RDT&E,N PROJECT COST ANALYSIS

Exhibit R-3 Cost Analysis (page 2)				PROGRAM ELEMENT: 0308601N				Date: FEB 2000				
APPROPRIATION/BUDGET ACTIVITY: 7								PROJECT NAME AND NUMBER: Modeling & Simulation, X2222				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY-99 Cost	FY-99 Award Date	FY-00 Cost	FY-00 Award Date	FY-01 Cost	FY-01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Simulation Experiments	Various	Various	N/A	N/A	N/A	4270	TBD	3420	TBD	Cont.	Cont.	Cont.
Subtotal T&E						4270		3420		Cont.	Cont.	Cont.
Remarks												
Engineering Studies/Analyses	Various	Various		-	-	2908	TBD	1713	TBD	Cont.	Cont.	Cont.
Program Management										Cont.	Cont.	Cont.
Subtotal Management						2908		1713		Cont.	Cont.	Cont.
Remarks												
Total Cost				0		12054		9106		Cont.	Cont.	Cont.

# EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0702207N

PROGRAM ELEMENT TITLE: Depot Maintenance (Non-IF)

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual*</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
H2451 P-3C SLAP	26,871	23,890	19,029	6,894	5,202	2,937	0	0	84,823
H2452 S-3 SLAP	21,847	14,151	4,624	0	0	0	0	0	40,622
H2740 T-45 SLAP	0	0	0	0	11,871	7,910	0	0	19,781
W2454 AN/ARC-210-RT-1794(C)*	5,639	1,723	567	752	0	0	0	0	8,681
W2737 Platform Follow-on Analysis	0	0	9,946	4,804	8,824	0	0	0	23,574
<b>TOTAL</b>	<b>54,357</b>	<b>39,764</b>	<b>34,166</b>	<b>12,450</b>	<b>25,897</b>	<b>10,847</b>	<b>0</b>	<b>0</b>	<b>177,481</b>

Quantity of RDT&E Articles

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Service Life Assessment Program (SLAP) on the P-3 to include all P-3 derivatives (H2451) and S-3B (H2452) began in FY 1999. These efforts are required to be conducted for these airframes to ascertain what actions must be taken to safely operate each system until the targeted end of service life. The results of the SLAP also provide justification for funding a Service Life Extension Program (SLEP) for fatigue limiting components with APN-5 funding. The AN/ARC-210-RT-1794(C) (W2454) will provide for the development of radio software modifications required for upgrades to the evolving standards.

JUSTIFICATION OF BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for the upgrade of existing, operational systems.

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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, Page 1 of 19)

**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0702207N**      **PROJECT NUMBER: H2451**  
**PROGRAM ELEMENT TITLE: Depot Maintenance**      **PROJECT TITLE: P-3 SLAP**

**(U) COST: (Dollars in Thousands)**

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual*</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
H2451 P-3 SLAP	26,871	23,890	19,029	6,894	5,202	2,937	0	0	84,823
<b>TOTAL</b>	<b>26,871</b>	<b>23,890</b>	<b>19,029</b>	<b>6,894</b>	<b>5,202</b>	<b>2,937</b>	<b>0</b>	<b>0</b>	<b>84,823</b>

**Quantity of RDT&E Articles**

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The P-3 Service Life Assessment Program (SLAP) will perform Non-Recurring Engineering (NRE) for the P-3 Service Life Extension Program (SLEP). SLAP includes a fatigue article destructive test of a full scale P-3C, associated pre-test and post-test analyses, NRE for designing SLEP kits, and post-test disposal. SLEP is a fatigue life extension program that will extend operational service life by replacing fatigue limiting airframe components. Present fatigue life estimates (from 20,000 to 24,000 flight hours) are based on analysis alone. SLAP will identify specific components that require replacement or modification in order to extend the aircraft model's service life beyond its original design parameters by approximately 6,000 flight hours. This SLAP effort was previously budgeted under APN-5 (BLI 538) funding within OSIP 02-99.

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

**1. FY 1999 ACCOMPLISHMENTS:**

- (U) (\$25,225) Initiated reaction frame buildup, pre-analysis, aircraft preparation.
- (U) (\$) 257) Provided preliminary engineering reports, quality assurance reports, preliminary SLEP drawings, and cost schedule status reporting.
- (U) (\$) 279) Continued contract support services.
- (U) (\$) 1,110) Provided Naval Air Warfare Center (NAWC) field support.

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2451

PROGRAM ELEMENT TITLE: Depot Maintenance

PROJECT TITLE: P-3 SLAP

2. FY 2000 PLAN:

- (U) (\$20,638) Initiate Fatigue article test.
- (U) (\$ 550) Provide engineering reports, quality assurance reports, preliminary SLEP drawings, cost schedule status reporting.
- (U) (\$ 1,659) Continue contract support services.
- (U) (\$ 1,043) Conduct high speed wind tunnel testing. Continue Naval Air Warfare Center (NAWC) field support.

3. FY 2001 PLAN:

- (U) (\$16,317) Initiate Fatigue life expended rebaseline and Structural Data Recording Set (SDRS) tracking algorithm development.
- (U) (\$ 250) Provide engineering reports, quality assurance reports, SLEP drawings, and cost schedule status reporting.
- (U) (\$ 642) Continue contract support services.
- (U) (\$ 1,820) Conduct coupon testing and new material evaluation/characterization. Provide Naval Air Warfare Center (NAWC) field support.

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UNCLASSIFIED

# EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0702207N      PROJECT NUMBER: H2451  
PROGRAM ELEMENT TITLE: Depot Maintenance      PROJECT TITLE: P-3 SLAP

## (U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	28,123	24,023	19,295
(U) Appropriated Value:	28,694	24,023	
(U) Adjustments from Pres Budget:	-1,252	-133	-266
(U) FY 2001 President's Budget Submit:	26,871	23,890	19,029

## CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 net decrease of \$1,252 thousand reflects a \$130 thousand reduction for inflation savings, a \$338 thousand reduction for reprioritization of requirements within the Navy and a \$784 thousand reduction for a SBIR assessment. The FY 2000 decrease reflects a \$133 thousand reduction for an Across-the-Board Congressional rescison. The FY 2001 net decrease of \$266 thousand reflects a \$120 thousand reduction for reprioritization of requirements within the Navy, a \$7 thousand decrease for Navy Working Capital Fund (NWCF), a \$5 thousand increase for Military and Civilian Pay, and a \$144 thousand decrease for revised economic assumptions.

(U) Schedule: Due to a reprioritization of FY99 program requirements PDR was delayed from the 2Q/99 to 3Q/99. In addition, CDR was delayed from 3Q/99 to 2Q/00. The FY99 contract award was delayed from 1Q/99 to 2Q/99. The FY 2001 events were added to document the Fatigue Life Expended (FLE) baselining (3Q/01) and SDRS development (4Q/01).

(U) Technical: Not Applicable.

(U) C. OTHER PROGRAM FUNDING SUMMARY: Not Applicable.

R-1 Item No. 197  
UNCLASSIFIED

# EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0702207N      PROJECT NUMBER: H2451  
 PROGRAM ELEMENT TITLE: Depot Maintenance      PROJECT TITLE: P-3 SLAP

(U) D. ACQUISITION STRATEGY: SLAP is a full and open competition for a fatigue article test. The contract will be a cost plus incentive fee (CPFF), therefore, providing an incentive to the contractor to effectively manage program cost and schedule. This program is in the source selection process. Contract award was March 1999. SLAP supports the Secretary of the Navy's Maritime Patrol Aircraft Ten Year Plan.

## (U) E. SCHEDULE PROFILE

FY 1999      FY 2000      FY 2001      TO COMPLETE

### (U) Program Milestones

#### (U) Engineering Milestones

Prelim. Design Review (3Q/99)      Critical Design Review (2Q/00)      Fatigue Life Expended Rebaseline (3Q/01)      SDRS Tracking Algorithm (4Q/01)

### (U) T&E Milestones

1Q/00 Conduct Fatigue Test  
 4Q/00 SLEP Kit Data Package

### (U) Contract Milestones

Contract Award (2Q/99)

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**EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS**

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2451

PROJECT TITLE: P-3 SLAP

<u>Cost Categories:</u>	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		FY2001 Award Date	Cost to Complete	Total Cost	Target Value of Contract
				Cost	Date	Cost	Date	Cost	Date				
Contracts	C/CPIF	LMAS		25,482	Mar 99	21,188	Feb 00	16,567	Nov 00		13,361	76,598	76,598
Subtotal Product Development				25,482		21,188		16,567			13,361	76,598	
Remarks:													
Field Activity Support	WX	NAWCAD Pax River, MD		1,110	Nov 98	1,659	Jan 00	1,820	Nov 00		1,320	5,909	
Subtotal Support				1,110		1,659		1,820			1,320	5,909	
Remarks:													
Subtotal Test & Evaluation													
Remarks:													
Contracts	C/CPIF	Various		279	Nov 98	1,043	Feb 00	642	Nov 00		352	2,316	2,316
Subtotal Management				279		1,043		642			352	2,316	
Remarks:													
Total Cost				26,871		23,890		19,029			15,033	84,823	

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# EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0702207N

PROGRAM ELEMENT TITLE: Depot Maintenance

PROJECT NUMBER: H 2452  
PROJECT TITLE: S-3 SLAP

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual*</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
H2452 S-3 SLAP	21,847	14,151	4,624	0	0	0	0	0	40,622
<b>TOTAL</b>	<b>21,847</b>	<b>14,151</b>	<b>4,624</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40,622</b>

Quantity of RDT&E Articles

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The S-3 Service Life Assessment Program (SLAP) (H2452) will determine the present S-3B fatigue life for 113 aircraft which were all procured from 1972 to 1976. The purpose is to validate the critical structures kit to ensure the aircraft meets its service life goal of 2015 and to determine the magnitude of the SLEP necessary to extend service life beyond 2015. The SLAP will certify an increase of the aircraft fatigue life from 13,000 flight hours to approximately 17,500 flight hours and from 3,000 to 4,300 catapults/arrested landings. This SLAP effort was previously budgeted under APN-5 (BLI 541) funding within OSIP 12-95.

# EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

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Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 7 of 19)

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0702207N  
PROGRAM ELEMENT TITLE: Depot Maintenance

PROJECT NUMBER: H2452  
PROJECT TITLE: S-3 SLAP

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 ACCOMPLISHMENTS:

- (U) (\$17,916) Service Life Assessment Program (SLAP)/Full Scale Fatigue Test (FSFT) contract awarded.
- (U) (\$ 3,781) Provided Field activity support for SLAP/FSFT efforts.
- (U) (\$ 150) Initiated contract support services.

2. FY 2000 PLAN:

- (U) (\$12,885) Continue SLAP/FSFT.
- (U) (\$ 1,096) Continue field activity support for SLAP/FSFT efforts.
- (U) (\$ 170) Continue contract support services.

3. FY2001 PLAN:

- (U) (\$4,159) Complete SLAP/FSFT effort.
- (U) (\$ 345) Final field activity support for SLAP/FSFT.
- (U) (\$ 120) Continue contract support services.

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**EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0702207N      PROJECT NUMBER: H2452**  
**PROGRAM ELEMENT TITLE: Depot Maintenance      PROJECT TITLE: S-3 SLAP**

**(U) B. PROGRAM CHANGE SUMMARY**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	23,634	14,230	4,691
(U) Appropriated Value:	23,781	14,230	
(U) Adjustments from Pres Budget:	-1,787	-79	-67
(U) FY 2001 President's Budget Submit:	21,847	14,151	4,624

**CHANGE SUMMARY EXPLANATION:**

(U) Funding: The FY 1999 net decrease of \$1,787 thousand is a \$108 thousand reduction for inflation savings and \$1,679 thousand reduction for the reprioritization of requirements within the Navy. The FY 2000 decrease reflects a \$79 thousand reduction for an Across-the-Board Congressional recession. The FY 2001 net decrease of \$67 thousand includes a \$17 thousand reduction for the reprioritization of requirements within the Navy and a \$50 thousand decrease for revised economic assumptions.

(U) Schedule: Not Applicable.

(U) Technical: Not Applicable.

**(U) C. OTHER PROGRAM FUNDING SUMMARY**

<u>APPN</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>
APN S-3 (OSIP 12-95)	9,992	8,836	12,383	9,756	6,629	4,205	2,547	0

NOTE: S-3B Critical Structures OSIP contains all S-3B structural degraders, not just those associated with SLAP.

**Related RDT&E**

( ) P.E.  
None.

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**EXHIBIT R-2a, FY 2000/2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 2000**

**BUDGET ACTIVITY: 7**      **PROGRAM ELEMENT: 0702207N**      **PROJECT NUMBER: H2452**  
**PROGRAM ELEMENT TITLE: Depot Maintenance**      **PROJECT TITLE: S-3 SLAP**

(U) D. ACQUISITION STRATEGY: The S-3 Service Life Assessment Program is a sole source procurement to the Original Equipment Manufacturer, Lockheed Martin of Marietta, GA. A CPIF contract was awarded October 1998.

**(U) E. SCHEDULE PROFILE**

**(U) Program Milestones**

**(U) Engineering Milestones**

Design Analysis (3Q/99)	Test Fixture Design and Assembly (1Q/00-3Q/00)
Development (1Q/99-4Q/99)	

**(U) T&E Milestones**

Full Scale Test (4Q/00)	Full Scale Test (1Q/01-4Q/01)
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**(U) Contract Milestones**

Contract Award (1Q/99)

<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>TO COMPLETE</u>
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**R-1 Item No. 197**  
**UNCLASSIFIED**

EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: H2452  
PROJECT TITLE: S-3 SLAP

Contract	Performing	Total	FY 1999 Award Date	FY 2000 Award Date	FY 2001 Award Date	FY 2001 Cost	Cost to Complete	Total Cost	Value of Contract	Target
Method & Type	Activity & Location	Prior Yrs Cost								
SS/CPIF	LMAS/Marietta, GA									
			17,916	12,885	4,159	34,960	34,960	34,960	34,960	

Subtotal Product Development

Remarks:

Contracts	C/FFP	RBC, VA	150	150	120	420	420	420	420	
Subtotal Support			150	150	120	420	420	420	420	

Remarks:

Test & Evaluation	WX	NAWC/AD Pax River, MD	3,319	20	20	3,359	3,359	3,359	3,359	
Subtotal Test & Evaluation			3,319	20	20	3,359	3,359	3,359	3,359	

Remarks:

Management	WX	NADEP North Island, CA	462	1,096	325	1,883	1,883	1,883	1,883	
Subtotal Management			462	1,096	325	1,883	1,883	1,883	1,883	

Remarks:

Total Cost			21,847	14,151	4,624	40,622	40,622	40,622	40,622	
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# EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0702207N      PROJECT NUMBER: W2454  
 PROGRAM ELEMENT TITLE: DEPOT MAINTENANCE      PROJECT TITLE: AN/ARC-210 RT-1794(C)

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
W2454 AN/ARC-210 RT-1794(C)*	5,639	1,723	567	752	0	0	0	0	8,681
<b>TOTAL</b>	<b>5,639</b>	<b>1,723</b>	<b>567</b>	<b>752</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8,681</b>

Quantity of RDT&E Articles

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Project W2454, AN/ARC-210 RT-1794(C): This project provides for the development of radio software modifications required for upgrades to the evolving standards. Annual engineering change proposals to accomplish implementation of additional advanced waveforms, have been planned to maintain interoperability/connectivity with other services, FAA and ICAO (commercial air traffic data links). Implementation of these waveforms is essential and will be accomplished in the Fleet by organizational units via the Memory Loader Verifier System (MLVS). These changes are the responsibility of the radio program for funding, management, and execution.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 ACCOMPLISHMENTS:

(U) (\$5, 639) Developed upgrades and initiated Engineering Change Orders (ECO) to meet requirements for DAMA SATCOM waveform standards upgrade; digital battlefield interoperability/connectivity communications; and commercial air traffic management data links (VHF Data Link (VDL) Mode 3).

FY 2000 PLAN:

(U) (\$1,723) Develop upgrades and initiate Engineering Change Orders (ECO) to meet requirements for upgrades to MIL STD 188-220, variable message formatting, communications security and commercial air traffic management data link interoperability (VDL Mode 3).

# EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

R-1 Item No. 197  
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Exhibit R-2a, Project Justification  
 (Exhibit R-2a, Page 12 of 19)

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0702207N

PROGRAM ELEMENT TITLE: DEPOT MAINTENANCE

PROJECT NUMBER: W2454

PROJECT TITLE: AN/ARC-210 RT-1794(C)

2. FY 2001 PLAN:

- (U) (\$ 567) Develop upgrades and initiate Engineering Change Orders (ECO) to meet requirements for improved satellite communications data rates. Upgrade radio operational software to include new waveforms for Demand Assigned Multiple Access Satellite Communications (DAMA SATCOM) and digital battlefield interoperability, and commercial air traffic management data links, obtain Joint Interoperability Test Center (JITC) certification, and initiate Software Integration Lab (SIL) tests.

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	6,445	1,733	576
(U) Appropriated Value:	6,486	1,733	
(U) Adjustments from Pres Budget:	-806	-10	-9
(U) FY 2001 President's Budget Submit:	5,639	1,723	567

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1999 decrease of \$806 thousand reflects a decrease of \$29 thousand for revised economic assumptions, a decrease of \$692 thousand for reprioritization of requirements within the Navy and a decrease of \$85 thousand for congressional undistributed adjustments. The FY 2000 decrease reflects a \$10 thousand reduction for an Across-the-Board Congressional rescission. The FY 2001 decrease of \$9 thousand reflects a \$2 thousand decrease for reprioritization of requirements within the Navy, a net decrease of \$1 thousand due to Strategic Sourcing Plan savings and Navy Working Capital Fund (NWCFF) adjustments, and a decrease of \$6 thousand for revised economic assumptions.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

R-1 Item No. 197  
UNCLASSIFIED

# EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7  
 PROGRAM ELEMENT: 0702207N  
 PROGRAM ELEMENT TITLE: DEPOT MAINTENANCE  
 PROJECT NUMBER: W2454  
 PROJECT TITLE: AN/ARC-210 RT-1794(C)

## (U) C. OTHER PROGRAM FUNDING SUMMARY

Appn	FY 1999 Budget	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	To Complete
APN L.I. 0577	99,829	81,077	71,620	90,001	87,764	109,523	101,240	Cont'd

## Related RDT&E

None.

(U) D. ACQUISITION STRATEGY: Sole source to Rockwell Collins, Inc. for the production and enhancement of the AN/ARC-210(V) Electronic Radio Protection radios.

(U) E. SCHEDULE PROFILE: Not Applicable

R-1 Item No. 197  
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# UNCLASSIFIED

## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: W2454  
PROJECT TITLE: AN/ARC-210  
RT-1794 (C)

<u>Cost Categories:</u>	Contract Method & Type	Performing Activity & Location	Total Prior Yrs Cost	FY 1999		FY 2000		FY 2001		Cost to Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date			
Prime Eqpm/E&MD Prime Contract	SS/ BOA	Rockwell Collins	0	3,727	5/99	1,195	11/99	408	11/00	555	5,885	5,830
Systems Engineering	Misc.	Cedar Rapids, IA Misc.	0	1,258	2/99	475	11/99	142	11/00	141	2,016	
<b>Subtotal Project Development</b>			<b>0</b>	<b>4,985</b>		<b>1,670</b>		<b>550</b>		<b>696</b>	<b>7,901</b>	
Remarks:												
<b>Subtotal Support</b>			<b>0</b>	<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>	<b>0</b>	
Remarks												
Systems T&E	Various	Various	0	614	4/99	35	11/99	12	11/00	16	677	
<b>Subtotal Test &amp; Evaluation</b>			<b>0</b>	<b>614</b>		<b>35</b>		<b>12</b>		<b>16</b>	<b>677</b>	
Remarks												
Travel	WX	NAWCAD Pax River, MD	0	40	11/98	18	11/99	5	11/00	40	103	
<b>Subtotal Management</b>			<b>0</b>	<b>40</b>		<b>18</b>		<b>5</b>		<b>40</b>	<b>103</b>	
Remarks												
<b>Total Cost</b>			<b>0</b>	<b>5,639</b>		<b>1,723</b>		<b>567</b>		<b>752</b>	<b>8,681</b>	

R-1 Item No. 197  
UNCLASSIFIED

# UNCLASSIFIED

EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0702207N

PROGRAM ELEMENT TITLE: Platform Follow-on Analysis

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
W2737 Platform Follow-on Analysis*	0	0	9,946	4,804	8,824	0	0	0	23,574
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>9,946</b>	<b>4,804</b>	<b>8,824</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23,574</b>

Quantity of RDT&E Articles

\* FY 01 includes CSA (\$5,507) and MMA (\$4,439); CSA only in other FYs.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Common Support Aircraft (CSA) is a phased modernization program to replace aging and costly E-2C, ES-3A, S-3B, and C-2A aircraft with carrier-compatible, long service life, mission platform(s). After exploring alternatives such as a new design aircraft and derivatives of existing aircraft the CSA program will develop and produce the solution that provides the required performance, capabilities, and 21<sup>st</sup> century growth potential at an affordable life cycle cost. Multi-mission Maritime Aircraft (MMA) was funded under PE 0605152N Project W2092 Studies and Analysis in FY 1998 and FY 1999. In FY 2001, the Concept Exploration (CE) phase continues to address replacement of the P-3C and EP-3E aircraft which reach the end of their fatigue life beginning in FY 2002. Funds supporting MMA Concept Exploration will develop an Analysis of Alternatives, and provide engineering and operations analysis support leading to milestone decisions for a major acquisition program.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 PLAN: Not Applicable
2. FY 2000 PLAN: Not Applicable
3. FY 2001 PLAN: (U) (\$5,507) The CSA consists of funding to initiate an analysis of alternatives (AoA) and other pre-EMD studies to explore airframes and systems.  
(U) (\$4,439) MMA will complete a AOA and phase 0 Concept Exploration Acquisition documentation.

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0702207N

PROGRAM ELEMENT TITLE: Platform Follow-on Analysis

DATE: February 2000

## (U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	0	0	0
(U) Appropriated Value:	0	0	
(U) Adjustments from Pres Budget:	0	0	9,946
(U) FY 2001 President's Budget Submit:	0	0	9,946

## CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 2001 net increase of \$9,946 thousand consists of an increase of \$5,580 thousand for CSA, an increase of \$4,500 thousand for MMA, a \$68 thousand decrease for Strategic Sourcing Plan savings, a \$26 thousand decrease for reprioritization of requirements within the Navy and a \$40 thousand decrease for revised economic assumptions.

(U) Schedule: In FY 2001, CSA and MMA program milestones are added.

(U) Technical:

## (U) C. OTHER PROGRAM FUNDING SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>
<u>Appn</u>	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>
None.								

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 7      DATE: February 2000  
PROGRAM ELEMENT: 0702207N      PROJECT NUMBER: W2737  
PROGRAM ELEMENT TITLE: Platform Follow-on Analysis      PROJECT TITLE: Platform Follow-on Analysis

Related RDT&E  
(U) PE 0605152N (Naval Aviation Studies)

D. (U) D. ACQUISITION STRATEGY: A CSA Acquisition Strategy document has not been prepared or approved. The MMA Mission Need Statement (MNS) has been submitted for validation and approval.

(U) E. SCHEDULE PROFILE

FY 1999      FY 2000      FY 2001      TO COMPLETE

(U) Program Milestones

CSA AOA 1Q/01  
CSA Initial ORD 4Q/01  
MMA 1Q/01 Concept  
Exploration  
MMA Engineering, Ops  
Analysis & Concept  
Evaluation

(U) Engineering Milestones

(U) T&E Milestones

(U) Contract Milestones

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## EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0702207N

PROJECT NUMBER: W2737

PROJECT TITLE: Platform Follow-on Analysis

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>		<u>Total Cost</u>	<u>Target Value of Contract</u>
				<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>		
Subtotal Product Development			0	0		0		0		0	
Remarks:											
CSA Studies	C/FFP	TBD	0	0		0		4,000		10,000	14,000
CSA Studies	C/FFP	TBD	0	0				1,257		3,228	4,485
MMA AOA	MIPR	FFRDC, VA						2,720	Dec 00	0	2,720
MMA Technical Support (CS)	C/FFP	TBD						300	Nov 00	0	300
MMA Concept Exploration Systems	WX	NAWC-AD						1,419	Nov 00	0	1,419
Engineering & Operations Analysis		Pax River, MD									
Subtotal Support			0	0		0		9,696		13,228	22,924

Remarks:

### Subtotal Test & Evaluation

0 0 0 0 0 0 0 0 0 0

Remarks:

CSA Studies, Analyses, and Evaluation WX Various

250 400 650

### Subtotal Management

250 400 650

Remarks:

Total Cost

9,946 13,628 23,574

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FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N  
PROGRAM ELEMENT TITLE: Industrial Preparedness

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R1050 Manufacturing Technology									
	57,363	58,778	59,626	60,611	61,154	61,669	64,143	CONT.	CONT.
R2674 Manufacturing Technology									
	9,686	12,431	0	0	0	0	0	0	22,117
R2696 Laser Diode Array									
	2,884	0	0	0	0	0	0	0	2,884
Total	69,933	71,209	59,626	60,611	61,154	61,669	64,143	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Manufacturing Technology (MANTECH) Program is intended to improve the productivity and responsiveness of the U.S. defense industrial base by funding the development of manufacturing technologies. The MANTECH program, by providing seed funding for the development of moderate to high risk process and equipment technology, permits contractors to upgrade their manufacturing capabilities. Ultimately, the program aims to produce high-quality weapon systems with shorter lead times and reduced acquisition costs. Major areas of endeavor both underway and planned include: advanced manufacturing technology for electronics assembly, laser metalworking, flexible computer manufacturing, composites, metal working and welding technology. The MANTECH program is aimed at achieving affordability in the acquisition of weapons systems by inserting manufacturing process solutions early into the design phase to reduce lifecycle costs, improve schedules and ensure quality.

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Budget Item Justification  
(Exhibit R-2, page 1 of 12)

# UNCLASSIFIED

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FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0708011N  
PROGRAM ELEMENT TITLE: Industrial Preparedness

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

(U) PROGRAM CHANGE FOR TOTAL PE:

(U) FY 2000 President's Budget:	FY 1999	FY 2000	FY 2001
(U) Appropriated Value:	68,886	59,104	60,179
(U) Adjustments from FY 2000 PRESBUDG:	-	71,604	-
(U) Execution Adjustments	-	-	-
(U) Small Business Innovation Research	+157	-	-
(U) Congressional Add	-1,682	-	-
(U) Congressional Rescissions	-	+12,500	-
(U) Inflation Savings	-	-395	-
(U) Various Rate Adjustments	-312	-	-
(U) Strategic Source Adjustments	-	-	-391
(U) Laser Diode Array Adjustment from RDT&E,DW	+2,884	-	-162
(U) FY 2001 PRESBUDG Budget Submission:	69,933	71,209	59,626

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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Budget Item Justification  
(Exhibit R-2, page 2 of 12)

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FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0708011N  
PROGRAM ELEMENT TITLE: Industrial Preparedness

PROJECT NUMBER & TITLE	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R1050									
Manufacturing Technology									
	57,363	58,778	59,626	60,611	61,154	61,669	64,143	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Manufacturing Technology (MANTECH) Program is intended to improve the productivity and responsiveness of the U.S. defense industrial base by funding the development of manufacturing technologies. The MANTECH program, by providing seed funding for the development of moderate to high risk process and equipment technology, permits contractors to upgrade their manufacturing capabilities. Ultimately, the program aims to produce high-quality weapon systems with shorter lead times and reduced acquisition costs. Major areas of endeavor both underway and planned include: advanced manufacturing technology for electronics assembly, laser metalworking, flexible computer manufacturing, composites, metal working and welding technology. The MANTECH program is being integrated into the Joint Mission Area/Support Area and Joint Warfare Operational Capability process and will utilize the results of these initiatives as appropriate in the program planning process. The MANTECH program is aimed at achieving affordability in the acquisition of weapons systems by inserting manufacturing process solutions early into the design phase to reduce lifecycle costs, improve schedules and ensure quality.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) The Navy MANTECH program executes a significant amount of its projects through the Centers of Excellence. The technical efforts performed are reflected throughout the following taxonomy:

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Budget Item Justification  
(Exhibit R-2, page 3 of 12)

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FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N PROJECT NUMBER: R1050  
 PROGRAM ELEMENT TITLE: Industrial Preparedness PROJECT TITLE: Manufacturing Technology

- (U) \$13,833 - Composites Processing and Fabrication - Continued work on the Composites Affordability Initiative, the Composites Topside Structures, KOREX II; Enhanced Production Techniques for Low Observable Structures and Materials; Gearbox Housing; Teaching Factory and Rapid Response projects, and Restart Z-Direction Reinforcement for Composite Laminates. Initiated new effort in Ceramic Matrix Composites and Resin Transfer Molding.
- (U) \$10,000 - Electronics Processing and Fabrication - Continued AEGIS Electronic Demonstration, Flexible Manufacturing of Microwave Power Module Manufacturing, Learning Center and Demonstration Factory, and the Power Electronic Building Blocks Manufacturing plan. Continued electro-optics efforts in Sapphire Domes, Manufacturing Automation of Monolithic Ring Gyros; and initiated efforts for Fiber Optic Velocity Sensors, Remote Source Lighting Technology, Conformal Acoustic Velocity Sensor Accelerometer Manufacturing, Radio Frequency Photonics for Multi-Function Phased Array Antennas, and Affordable Array Technology Tooling.
- (U) \$21,000 - Metals Processing and Fabrication - Continued the following metalworking projects: Centrifugally Cast Titanium/Chromium Bronze Components, Neodymium Ribbon Development, Optimized Atomization of Magnesium Powder, Titanium Alloy Hearth Melting Processing Technology, Optimized High Strength Lightweight Alloy Welding, and Thin Wall Superalloy Structural Castings. Completed Powder Metallurgy and Materials Initiative. Continued the following joining projects: Weld Residual Stress and Distortion, Titanium Welding, Adhesive Bonding Integrity, Knowledge Based Ultrasonic Testing of Welds, and continue rapid response actions. Continued the following materials processing initiatives: Laser Processing of Nickel Aluminum Bronze, Non-Contact High Speed Gear Inspection, Repair/Refurbishment of Fatigue/Wear Limited Navy Structures, Advanced Manufacturing Processes for the Advanced Amphibious Assault Vehicle, and Manufacturing of High Performance of Transmission Housing. Initiated Femto 2<sup>nd</sup> Laser project to support the Joint Strike Fighter Office. Initiate project in Propulsor Improvements; Smart Sensors/Actuators; Adaptive Control for Mechanized Welding; Amphibious Assault Vehicle (AAV) Enhanced Armor Kit; Nd:YAG Laser Repair of Catapult Troughs; and Improved Through Thickness Properties of Heavy Gauge Steel.

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Budget Item Justification  
 (Exhibit R-2, page 4 of 12)

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FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N PROJECT NUMBER: R1050  
PROGRAM ELEMENT TITLE: Industrial Preparedness PROJECT TITLE: Manufacturing Technology

-- (U) \$6,400 - Advanced Manufacturing Enterprise- Continued leveraging the Best Manufacturing Practices and the Acquisition Center of Excellence Acquisition Reform Initiatives. Continued documenting environmental manufacturing and business practices. Continued efforts in shipbuilding and simulation based design. Continued efforts in Shipboard Sensors; Effective Aluminum Catamaran Structures; Chromium Primer for Aluminum Substrates; and the Environmental Resource Information Center. Continued ongoing and initiated new research efforts in support of the Maritime Technology Advanced Shipbuilding Enterprise. Initiated project for Heavy Equipment Repair; Automated Paint Application Containment; Crew Compartment Heater; and AAV Manufacturing Enhancement.

-- (U) \$6,130 - Other - Continued projects in the repair technology arena that support the depots and shipyards. Continued the Ammonium Dinitramide; Low Cost and Improved Line Charge Munitions Manufacturing projects in support of energetic materials. Continued Phase III of the F414 Engine Demonstration Device with General Electric. Continued Production Tooling for Concept 1 Payload in support of Surface Ship Torpedo Defense. Fund technical engineering work at Navy labs and field activities to support Center projects.

## 2. (U) FY 2000 PLAN:

- (U) The Navy MANTECH program executes a significant amount of its projects through the Centers of Excellence. The technical efforts performed are reflected throughout the following taxonomy:
  - (U) \$12,000 - Composites Processing and Fabrication - Continue work on the Composites Affordability Initiative; the Composites Topside Structures; Enhanced Production Techniques for Low Observable Structures and Materials; Teaching Factory; Rapid Response; Z-Direction Reinforcement for Composite Laminates; Ceramic Matrix Composites; and Resin Transfer Molding. Complete Korex Phase II.
  - (U) \$8,000 - Electronics Processing and Fabrication - Continue AEGIS Electronic Demonstration, Flexible Manufacturing of Microwave Power Module Manufacturing, Learning Center and Demonstration Factory, and the Power Electronic Building Blocks Manufacturing plan. Continue electro-optics efforts in Sapphire Domes, Manufacturing Automation of Monolithic Ring Gyros; and initiate efforts for Fiber

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Budget Item Justification  
(Exhibit R-2, page 5 of 12)

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FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0708011N

PROJECT NUMBER: R1050

PROGRAM ELEMENT TITLE: Industrial Preparedness

PROJECT TITLE: Manufacturing Technology

Optic Velocity Sensors, Remote Source Lighting Technology, Conformal Acoustic Velocity Sensor Accelerometer Manufacturing, and Radio Frequency Photonics for Multi-Function Phased Array Antennas, and Affordable Array Technology Tooling.

--

(U) \$19,600 - Metals Processing and Fabrication - Continue the following metalworking projects: Centrifugally Cast Titanium/Chromium Bronze Components, Neodymium Ribbon Development, Optimized Atomization of Magnesium Powder, Titanium Alloy Hearth Melting Processing Technology, Optimized High Strength Lightweight Alloy Welding, and Thin Wall Superalloy Structural Castings. Complete Powder Metallurgy and Materials Initiative; Femto 2<sup>nd</sup> Laser. Continue the following joining projects: Weld Residual Stress and Distortion, Titanium Welding, Adhesive Bonding Integrity, Knowledge Based Ultrasonic Testing of Welds, and continue rapid response actions. Continue the following materials processing initiatives: Laser Processing of Nickel Aluminum Bronze, Non-Contact High Speed Gear Inspection, Repair/Refurbishment of Fatigue/Wear Limited Navy Structures, Advanced Manufacturing Processes for the Advanced Amphibious Assault Vehicle, and Manufacturing of High Performance of Transmission Housing. Continue joint effort with the Air Force in Metals Affordability. Continue work on the Propulsor Affordability Initiative; Advanced Manufacturing processing for AAV Tracks and Roadwheels; and the Enhanced Applique Armor Kit Product Improvement.

--

(U) \$7,400 - Advanced Manufacturing Enterprise - Continue leveraging the Best Manufacturing Practices and the Acquisition Center of Excellence Acquisition Reform Initiatives. Continue documenting environmental manufacturing and business practices. Continue efforts in shipbuilding and simulation based design. Continue efforts in Shipboard Sensors; Effective Aluminum Catamaran Structures; Chromium Primer for Aluminum Substrates; and the Environmental Resource Information Center. Continue ongoing and initiate new research efforts in support of the Maritime Technology Advanced Shipbuilding Enterprise. Continue efforts in Propulsor Encapsulation. Continue pathways for Continuous Improvement Program. Continue Supply Chain Integration program in support of shipbuilding commerce. Continue to work with the Navy, commercial and international shipyards on identifying best business practices. Initiate manufacturing projects to support the DD-21 platform (based on the manufacturing study conducted by the DD-21 Program Office).

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Budget Item Justification  
(Exhibit R-2, page 6 of 12)

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FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N PROJECT NUMBER: R1050  
PROGRAM ELEMENT TITLE: Industrial Preparedness PROJECT TITLE: Manufacturing Technology

- (U) \$11,778 - Other - Continue projects in the repair technology arena that support the depots and shipyards such as Supercritical CO2 Parts Cleaning, Ball Valve Repair Process Improvement, System. Shearography System Development, and Reverse and Re-Engineering Technical Data Generation, System. Continue the Ammonium Dinitramide and Composite Propellants projects in support of energetic materials. Support Power Electronic Building Block testbed for manufacturing of electric vehicles. Support shipbuilding initiatives as they related to manufacturing processes. Continue engineering technical support with the Systems Commands Program Offices and Program Executive Offices to provide Technical Assistants for each project supported by the MANTECH Executive Steering Committee. Initiate industrial base and affordability studies to determine manufacturing gaps for future work.

## 3. U) FY 2001 PLAN:

- The Navy MANTECH program executes a significant amount of its projects through the Centers of Excellence. The technical efforts performed are reflected throughout the following taxonomy:
  - (U) \$6,000 - Composites Processing and Fabrication - Complete work on the Composites Affordability Initiative. Continue work on the Composites Topside Structures; Enhanced Production Techniques for Low Observable Structures and Materials; Teaching Factory; Rapid Response; Z-Direction Reinforcement for Composite Laminates; Ceramic Matrix Composites; and Resin Transfer Molding. Continue Korex Phase III.
  - (U) \$8,000 - Electronics Processing and Fabrication - Continue AEGIS Electronic Demonstration, Flexible Manufacturing of Microwave Power Module Manufacturing, Learning Center and Demonstration Factory, and the Power Electronic Building Blocks Manufacturing plan. Continue electro-optics efforts in Sapphire Domes, Manufacturing Automation of Monolithic Ring Gyros; and initiate efforts for Fiber Optic Velocity Sensors, Remote Source Lighting Technology, Conformal Acoustic Velocity Sensor Accelerometer Manufacturing, Radio Frequency Photonics for Multi-Function Phased Array Antennas, and Affordable Array Technology Tooling.
  - (U) \$19,500 - Metals Processing and Fabrication - Continue the following metalworking projects: Centrifugally Cast Titanium/Chromium Bronze Components, Neodymium Ribbon Development, Optimized

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Budget Item Justification  
(Exhibit R-2, page 7 of 12)

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FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N PROJECT NUMBER: R1050  
PROGRAM ELEMENT TITLE: Industrial Preparedness PROJECT TITLE: Manufacturing Technology

Atomization of Magnesium Powder, Titanium Alloy Hearth Melting Processing Technology, Optimized High Strength Lightweight Alloy Welding, and Thin Wall Superalloy Structural Castings. Complete Powder Metallurgy and Materials Initiative; Femto 2<sup>nd</sup> Laser. Continue the following joining projects: Weld Residual Stress and Distortion, Titanium Welding, Adhesive Bonding Integrity, Knowledge Based Ultrasonic Testing of Welds, and continue rapid response actions. Continue the following materials processing initiatives: Laser Processing of Nickel Aluminum Bronze, Non-Contact High Speed Gear Inspection, Repair/Refurbishment of Fatigue/Wear Limited Navy Structures, Advanced Manufacturing Processes for the Advanced Amphibious Assault Vehicle, and Manufacturing of High Performance of Transmission Housing. Continue a joint effort with the Air Force in Metals Affordability. Continue work on the Propulsor Affordability Initiative.

-- (U) \$6,000 - Advanced Manufacturing Enterprise - Continue leveraging the Best Manufacturing Practices and the Acquisition Center of Excellence Acquisition Reform Initiatives. Continue documenting environmental manufacturing and business practices. Continue efforts in shipbuilding and simulation based design. Continue efforts in Shipboard Sensors; Effective Aluminum Catamaran Structures; Chromium Primer for Aluminum Substrates; and the Environmental Resource Information Center. Continue ongoing and initiate new research efforts in support of the Maritime Technology Advanced Shipbuilding Enterprise. Continue work on the Pathways for Continuous Improvement Program, and Supply Chain Integration.

-- (U) \$9,568 - Other - Continue projects in the repair technology arena that support the depots and shipyards such as Supercritical CO2 Parts Cleaning, Ball Valve Repair Process Improvement, Shearography System Development, and Reverse and Re-Engineering Technical Data Generation System. Continue the Ammonium Dinitramide and Composite Propellants projects in support of energetic materials. Continue Phase III of the F414 Engine Demonstration Device with General Electric. Continue technical assistant work at the Systems Command's Program Offices and Program Executive Offices.

-- (U) \$6,000 - Initiate two new affordability efforts to include joining, metals and electronics to follow the Composites Affordability Initiative Model.

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Budget Item Justification  
(Exhibit R-2, page 8 of 12)

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FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0708011N      PROJECT NUMBER: R1050  
PROGRAM ELEMENT TITLE: Industrial Preparedness      PROJECT TITLE: Manufacturing Technology

-- (U) \$4,558 - Initiate efforts based on the prioritization submitted by the MANTECH Executive Steering Committee. Initiatives will be focused on composites, metals and electronics.

B. (U) PROGRAM CHANGE SUMMARY: See total program change summary for PE

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:  
(U) PE 0708011F (Industrial Preparedness)  
(U) PE 0708045A (End Item Industrial Preparedness Activities)  
(U) PE 0708011S (Industrial Preparedness)

D. (U) SCHEDULE PROFILE: Not applicable.

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Budget Item Justification  
(Exhibit R-2, page 9 of 12)

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FY 2001 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 2000

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N PROJECT NUMBER: R1050  
 Technology PROGRAM ELEMENT TITLE: Industrial Preparedness PROJECT TITLE: Manufacturing

## A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
a. Process Development	50,855	53,617	54,400
b. Program Management Support	6,508	5,161	5,226
Total	57,363	58,778	59,626

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RDT&E PE/Project Cost Breakdown  
 (Exhibit R-3, page 10 of 12)

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FY 2001 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0708011N      PROJECT NUMBER: R1050  
Technology      PROGRAM ELEMENT TITLE: Industrial Preparedness      PROJECT TITLE: Manufacturing

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION: (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1998 & Prior	FY 1999 Budget	FY 2000 Budget	FY 2001 Budget	To Complete	Total Program
Product Development										
GLCC	C/BAA	1995	CONT.	CONT.	100,928	13,833	12,000	6,000	CONT.	CONT.
CTC	SS/CPFF	1988	CONT.	CONT.	181,495	15,000	15,000	12,000	CONT.	CONT.
EWI	C/BAA	1996	CONT.	CONT.	11,100	3,000	3,000	3,000	CONT.	CONT.
ACI	C/BAA	1995	CONT.	CONT.	15,500	6,000	5,500	5,500	CONT.	CONT.
UNO	C/BAA	1998	CONT.	CONT.	5,875	4,000	3,500	3,500	CONT.	CONT.
PSU	C/CPFF	1997	CONT.	CONT.	10,450	3,400	4,600	4,200	CONT.	CONT.
BFTC	C/CA	1994	CONT.	CONT.	11,881	0	0	0	0	11,881
PTI	C/CPFF	1997	CONT.	CONT.	10,000	4,500	4,800	4,300	CONT.	CONT.
ARL/PSU	C/CA	1999	17,000	25,000	1,000	4,000	2,500	2,500	CONT.	CONT.
NSWC-CD	WX	1998	UNK	UNK	UNK	1,000	1,000	1,200	CONT.	OCNT
NSWC-IN	WX	1996	UNK	UNK	UNK	2,000	2,000	2,000	CONT.	CONT.
TBD	TBD	TBD	TBD	TBD	0	0	3,000	9,000	0	0
NAVAIR	PD	1996	CONT	CONT	UNK	0	1,000	1,000	CONT	CONT
IPI	C/CPFF	1995	UNK	UNK	6,974	0	0	0	0	9,542
Miscellaneous	WX/RC/WR	Various	Various	Various	13,343	630	878	5,426	CONT.	CONT.
Support and Management: Not applicable.										

Test and Evaluation: Not applicable.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

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RDT&E PE/Project Cost Breakdown  
(Exhibit R-3, page 11 of 12)

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# UNCLASSIFIED

FY 2001 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 2000

BUDGET ACTIVITY: 7      PROGRAM ELEMENT: 0708011N      PROJECT NUMBER: R1050  
 Technology      PROGRAM ELEMENT TITLE: Industrial Preparedness      PROJECT TITLE: Manufacturing

	Total FY 1998 & Prior	FY 1999 Budget	FY 2000 Budget	FY 2001 Budget	To Complete	Total Program
Subtotal Product Development	368,546	57,363	58,778	59,626	CONT.	CONT.
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	368,546	57,363	58,778	59,626	CONT.	CONT.

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RDT&E PE/Project Cost Breakdown  
 (Exhibit R-3, page 12 of 12)

# UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2, RDT&E Budget Item Justification									
DATE: February 2000									
APPROPRIATION/BUDGET ACTIVITY									
R-1 ITEM NOMENCLATURE									
Program Element (PE) Name and No. MARITIME TECHNOLOGY/0708730N									
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7									
COST (\$ in Millions)									
	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total PE Cost	18.392	21.431	9.366	15.166	7.519	0.000	0.000	0.000	71.874
MARITECH/S2466	18.392	21.431	9.366	15.166	7.519	0.000	0.000	0.000	71.874
Quantity of RDT&E Articles	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

## A. Mission Description and Budget Item Justification

MARITECH was initiated by DARPA in 1994 as part of the President's National Shipbuilding Initiative to enhance the commercial viability of the U.S shipbuilding industry and preserve that section of the defense industrial base. The MARITECH Advanced Shipbuilding Enterprise (ASE) is a Navy program that builds on the progress made by the original DARPA MARITECH program. The mission of the program is to manage and focus national research funding on technologies that will reduce the cost of naval ships and will enhance U.S. commercial shipbuilding competitiveness. MARITECH ASE combines DARPA's MARITECH and the Navy's National Shipbuilding Research Program (NSRP). Industry has expanded on the long standing collaborative network of the NSRP to form an organizational structure to execute the research projects accomplished under MARITECH ASE.

The industry has developed a landmark long range Strategic Investment Plan which will guide MARITECH ASE investments. This Strategic Investment Plan provides a framework to guide collaborative research and development among all segments of the U.S. ship construction and repair industry, educational and research institutions, and Government. The objective is to assist the industry in achieving significant reduction in the cost and time required for both commercial and Navy ship construction, conversion, and repair. The recommended investment portfolio includes major initiatives that tie the strategic vision to proposed industry research through collaborative R&D. The major initiatives include: Shipyard Production Process Technologies, Business Process Technologies, Product Design and Material Technologies, Systems Technologies, Facilities and Tooling. Additionally, several critical success factors were found to cut across all of the major initiatives. These "Crosscut Initiatives" include Education and Training, Technology Transfer, Organizational Change, Environmental Protection and Human Resources.

MARITECH ASE has a number of distinguishing features. It is: a) led by an industry collaboration; b) guided by an industry developed Strategic Investment Plan; c) a structured analytical process for cost/benefit decisions; d) maintaining market led benchmarking and metrics to track industry progress; e) promoting collaboration with the research and acquisition communities; f) fostering cooperation with ship owners, designers, regulators, suppliers and other industry stakeholders; and g) leveraging work accomplished by other industries/countries.

The collaboration of major shipyards that lead the program are: Electric Boat Corporation, Bath Iron Works, Newport News Shipbuilding, Atlantic Marine, Litton Ingalls Shipbuilding, Friede/Goldman/Halter Marine, Litton Avondale, NASSCO, Todd Pacific and Cascade General.

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Exhibit R-2, RDT&E Budget Item Justification  
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CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification		DATE:
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE	February 2000
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7		
<p>FY 1999 ACCOMPLISHMENTS: (18,392)</p> <ul style="list-style-type: none"> <li>- (U) ( 490K) Established and staffed a co-located multi-agency MARITECH ASE support office (NAVSEA, MARAD, ONR).</li> <li>- (U) ( 452K) Established, developed and executed a Joint Funding Agreement with the shipbuilding industry collaboration using other transactions authority.</li> <li>- (U) (13,839K) Worked with the industry collaboration to award cost-shared technology development projects in accordance with the Strategic Investment Plan (SIP) covering the major initiative areas (MIA) of Shipyard Production Process Technologies, Business Process Technologies, Product Design and Material Technologies, Systems Technologies, Facilities and Tooling and the cross-cut initiatives which include Education and Training, Technology Transfer, Organizational Change, Environmental Protection and Human Resource Optimization.</li> <li>- (U) ( 275K) Supported Government and university participation on the industry-led major initiative teams. Participants promoted technology transfer between the industry and the R&amp;D community and acted as technology scouts for the industry.</li> <li>- (U) ( 503K) Transferred ongoing research projects from DARPA MARITECH and the National Shipbuilding Research Program to the MARITECH ASE program in order to consolidate management resources. Supported existing Cooperative Agreements including agents such as MARAD, ONR, NSWC, and NRL to continue and close out the remaining DARPA projects.</li> <li>- (U) ( 250K) Performed an annual review and updated the Strategic Investment Plan.</li> <li>- (U) ( 200K) Performed a benchmarking study to assess the competitive position of the industry.</li> <li>- (U) ( 2,383K) As directed by Congress, provided funds to ONR to develop advanced concepts to mitigate marine oil spills caused by tanker casualties.</li> </ul> <p>FY 2000 PLAN: (21,431K)</p> <ul style="list-style-type: none"> <li>- (U) (10,371K) Continue technology development projects in the six major initiative areas selected from Research Announcement One (13 projects).</li> <li>- (U) ( 8,305K) Commence technology development projects in the six major initiative areas selected from Research Announcement Two.</li> <li>- (U) ( 1,500K) Continue utilization of industry-led major initiative teams to perform the execution and annual review of the SIP, including technology transfer among the Navy, the shipbuilding industry, academia, equipment and material suppliers and the R&amp;D community.</li> <li>- (U) ( 500K) Operate multi-agency support office to facilitate technology transfer between Government and industry.</li> <li>- (U) ( 255K) Complete close out of DARPA MARITECH and NSRP projects that transferred to MARITECH ASE.</li> <li>- (U) ( 500K) Conduct economic technology investment analysis and business model study.</li> </ul>		

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Exhibit R-2, RDT&E Budget Item Justification  
(Exhibit R-2, page 2 of 6)

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CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification		DATE:	February 2000
APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE	
<b>RESEARCH DEVELOPMENT TEST &amp; EVALUATION, NAVY/BA-7</b>		Program Element (PE) Name and No. MARITIME TECHNOLOGY/0708730N	
FY 2001 PLAN: (9,366K)			
- (U) (7,038K) Continue technology development projects in the six major initiative areas selected from Research Announcement One (13 projects).			
- (U) ( 328K) Commence technology development projects in the six major initiative areas selected from Research Announcement Two.			
- (U) (1,500K) Continue utilization of industry-led major initiative teams to perform the execution and annual review of the SIP, including technology transfer among the Navy, the shipbuilding industry, academia, equipment and material suppliers and the R&D community.			
- (U) ( 500K) Operate multi-agency support office to facilitate technology transfer between Government and industry.			
B. Program Change Summary:			
FY 2000 President's Budget Submit:		FY 1999	FY 2000
Appropriated Value:		19,000	19,681
Adjustment to FY 1999 Appropriated Value/FY 2000 President's Budget:		-0.608	-0.250
FY 2001 PRES Budget Submit:		18,392	21,431
			FY 2001
			19,382
			-10,016
			9,366
Funding: FY 99: Program transferred from DARPA (MARITIME TECHNOLOGY, PE 0603746E) - \$19.0M; -\$608K for congressional undistributed reductions; F00: -\$250K minor pricing adjustments. FY 01: -\$594K minor pricing adjustments, -\$9,542K for program restructure.			
Technical: Not applicable.			
C. Other Program Funding Summary (Related RDT&E): DARPA P.E. 0603746E (MARITECH) - MARITECH ASE follows the original DARPA MARITECH program. Work remaining under the original DARPA program will transition to the MARITECH ASE program.			
D. Acquisition Strategy: R&D projects will be solicited and awarded by an industry collaboration represented by the Executive Control Board (ECB) of the National Shipbuilding Research Program (NSRP). The Navy has entered into an agreement with the industry collaboration using "other transactions."			

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Exhibit R-2, RDT&E Budget Item Justification  
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CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification		DATE:	February 2000
APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE	
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-7		Program Element (PE) Name and No. MARITIME TECHNOLOGY/0708730N	
E. Schedule Profile:			
Engineering Milestones: N/A		FY 99	FY 01
T&E Milestones: N/A			
Contract Milestones:			
Other Program Events:			
2Q Solicit Proposals for Technology Develop. Projects *3Q Sign "Other Transactions" Agreement w/Industry 3Q Evaluate Proposals 4Q Initiate 2nd Technology Development Solicitation 2Q Staff Multi-Agency Program Office 3Q Initiate New Technology Development Projects 3Q Begin Update of Benchmarking Study/SIP 4Q Sponsor Ship Production Symposium 4Q Sponsor Technology Advisory Forum **Other Transactions" Agreement signed April 9, 1999 moving it from 2Q99 into 3Q99 with no financial impact		2Q Award 2nd Set-Tech. Develop. Projects 3Q Begin Update of Benchmarking Study/SIP 4Q Initiate 3rd Technology Develop. Solicitation	1Q Award 3rd Set-Tech Develop. Projects 3Q Begin Update of Benchmarking Study/SIP 4Q Initiate 4th Tech Develop. Solicitation

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Exhibit R-2, RDT&E Budget Item Justification  
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Exhibit R-3 Cost Analysis (page 1)				DATE:		February 2000						
APPROPRIATION/BUDGET ACTIVITY				PROGRAM ELEMENT		PROJECT NAME AND NUMBER						
RDT&E, N				MARITIME Technology-PE 0708730N		MARITECH/S2466						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Technology Development	SS OT*	ECB NSRP**	0.000	15.178	3Q99	20.606	2Q00	8.696	2Q01	21.345	65.825	65.825
Technology Development	Reqn***	TRW/Schafer Corp.		0.446		0.400		0.420		0.840	2.106	2.106
Technology Development	SS	PSU/APL		0.075		0.100		0.100		0.200	0.475	0.475
Subtotal Product Development			0.000	15.699		21.106		9.216		22.385	68.406	68.406
Remarks:												
* Other Transactions IAW 10 USC 2371												
** Executive Control Board of the National Shipbuilding Research Program												
*** Procure under GSA Schedule												
Gov't Support Serv/Other Agencies	MIPR/MR	Various	0.000	2.401	3Q99	0.058	2Q00	0.050	2Q01	0.100	2.609	3.802
Support Services Revolving Accts	MIPR/MR	Various	0.000	0.292	2Q99	0.267	2Q00	0.100	2Q01	0.200	0.859	1.066
Subtotal Support			0.000	2.693		0.325		0.150		0.300	3.468	4.868
Remarks:												

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Exhibit R-3, Project Cost Analysis  
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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)		DATE:		February 2000								
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT		PROJECT NAME AND NUM								
RDT&E, N		MARITIME Technology-PE 0708730N		MARITECH/S2466								
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Subtotal T&E			0.000	0.000				0.000		0.000	0.000	
Remarks:												
Contract Support Services												
Subtotal Management			0.000	0.000				0.000		0.000	0.000	
Remarks:												
Total Cost			0.000	18.392			21.431	9.366		22.685	71.874	71.874
Remarks:												

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Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 6 of 6)

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